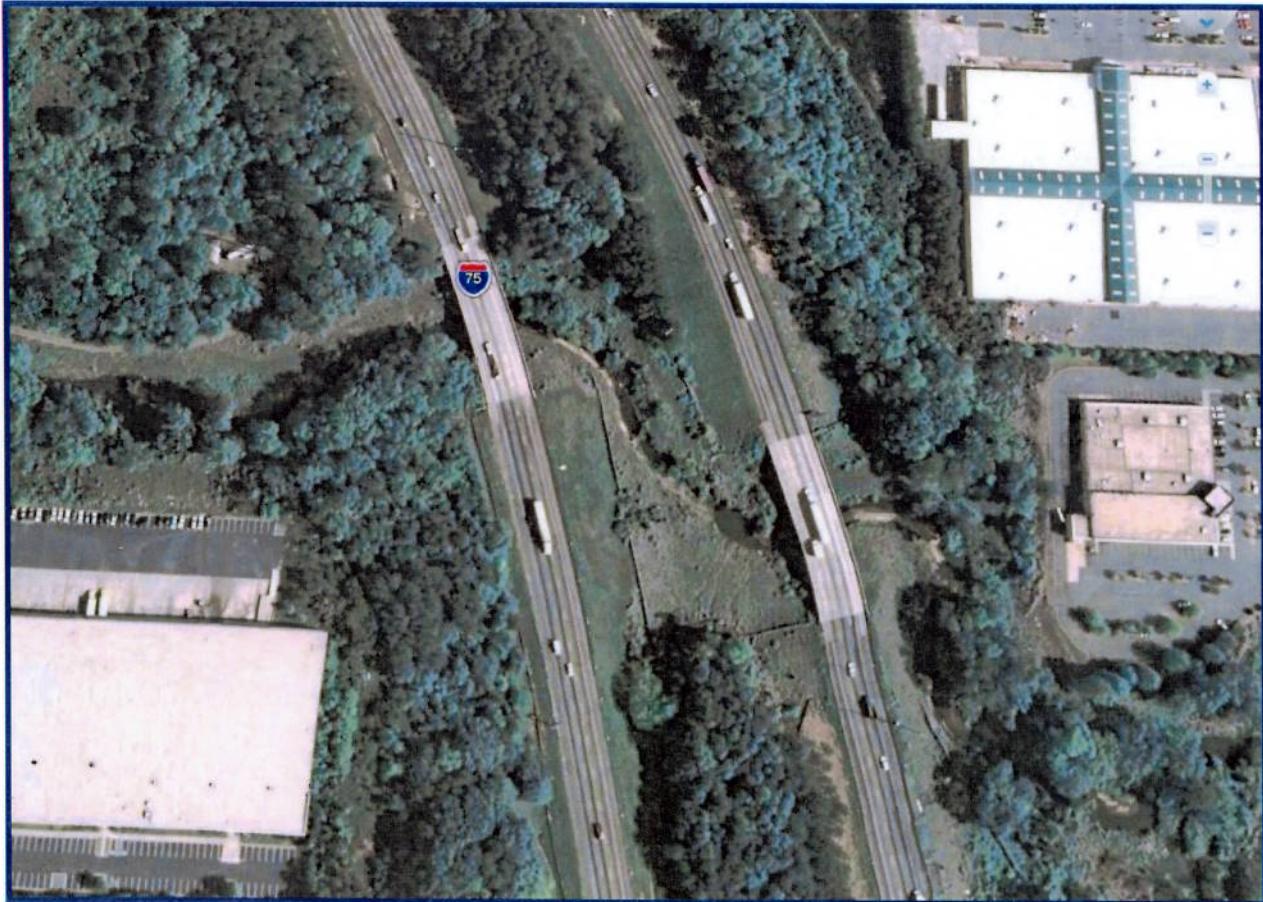


Hydraulic and Hydrological Study for I-75 Reversible lanes over Noonday Creek

**NH000-0073-03(242)
Cobb County, Georgia
PI No. 714130**

November 2009



**COMMUNITY COORDINATION ONLY REQUIRED
Cobb County, Community No. 130052**

**Prepared by JBT for
Georgia Transportation Partners
Atlanta, GA**



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Section I
Hydraulic/Hydrologic Report

November 2009

NH000-0073-03(242) Cobb County
I-75 Reversible lanes over Noonday Creek
PI# 714130

Introduction

J.B. Trimble, Inc. (GBT) prepared this report to provide engineering calculations showing that the proposed bridge widening at the crossing of I-75 over Noonday Creek in Cobb County, Georgia will meet the Georgia Department of Transportation's (GDOT) hydraulic and hydrologic requirements. Noonday Creek is a FEMA studied waterway with a regulatory floodway. The proposed widening will not encroach vertically or horizontally on the current regulatory floodway elevation or width. Therefore, the proposed construction is consistent with the regulatory floodway due to bridging and excluding fill from the floodway. In accordance with section NS 23 CFR 650A of the Federal Policy Guide, coordination with FEMA is not required. However, since this site is located in the developing area of Cobb County, a "no-rise" was obtained and coordination will be done with the community. The design storm is the 50-year storm per the GDOT Drainage Design Manual for an Interstate. The drainage area at the proposed crossing, delineated from the United States Geological Survey (USGS) quadrangle maps for the area, is 11.0 square miles with a 50-year storm flow of 6003 cfs and a 100-year storm flow of 6889 cfs. The flows are calculated using the USGS Region 1 Urban Regression equations for Georgia and an impervious area of 25%.

The existing bridges at this crossing consist of parallel 240 ft long bridges on concrete bents with spillthrough abutments. The existing bridge widths are 60 ft gutter to gutter. The proposed construction will widen the northbound bridge to the inside by a varying width with a maximum of 50'- 5-1/2". No work is proposed for the existing southbound bridge.

Incorporated in the hydraulic models is the latest research on expanded and contracted flow for locating exit and approach sections. These locations are based on channel slope, main channel

*Explain why bridge is being widened on a skew
Need Bridge Cond. & Deck Condition Surveys for bridge widening.*

and overbank Manning's "n" values and the ratio of the bridge opening to the floodplain width. This information is used to locate the exit and approach sections. This process is discussed in the *General Modeling Considerations* section in this report. HEC-RAS models were developed for this study and the WSPRO bridge routine was selected for the proposed model. HEC-RAS version, 4.0 was used for the study.

Hydraulic Site Visit

A hydraulic site visit was made at the existing crossing of I-75 over Noonday Creek on August 26, 2009. The upstream and downstream floodplains consist of some trees, underbrush and a thick layer of Kudzu. This crossing is located in a developed area of Cobb County and there are commercial developments located in the northeast, southeast and southwest quadrants. The Noonday Creek channel width varies from approximately 35-50 ft. The channel bottom of this urbanized stream has degraded, resulting in a widening of the channel and banks that are generally unstable and approximately 7 ft high.

The existing parallel 240 ft long steel beam bridges are staggered at this crossing in order to span the meandering Noonday Creek channel. The existing bents align well with the channel. However, the flood flow skew is approximately 45 degrees (see the contour plot in the Appendix). The existing abutment and intermediate bent setbacks are acceptable. The existing bridges consist of three 80 ft long steel beam spans on concrete bents with spillthrough abutments. Both bridges are built 90 degrees to the roadway centerline.

A sewer line was observed along the north bank of Noonday Creek. Two manholes were noted just upstream of the north bound bridge. A multi-conduit utility was observed attached to the downstream side of the northbound bridge (exterior bay). There are no utilities attached to the upstream side of the northbound bridge in the area of the proposed widening.

An additional site visit was made on September 21, 2009 during the excessive rainfall experienced over the Atlanta area. At this time, the water level just upstream from the northbound bridge was even with the tops of the aforementioned manholes.

Procedure

JBT personnel visited and photographed the site. A GDOT Hydraulic Engineering Field Report was completed. The drainage area and Manning's "n" values were determined and storm flows were calculated for this Region 1 site. HEC-RAS computer models were developed for the natural, existing and proposed conditions using survey data and proposed roadway improvements.

General Modeling Considerations

The FEMA discharges for this site are consistent with the USGS generated urbanized discharges for region 1. The Flood Insurance Study (FIS) for Cobb County has recently been revised (December of 2008). The 100-year FEMA flow in this FIS is 7348 cfs while the USGS flow is 6889 cfs. For the USGS flows, the urbanized equations are being used with an impervious area of 25% based on the current aerial photography. During the design of another project (NH000-0575-01(028)) the USGS was contacted along with a consultant with experience in the calculation of the FEMA flows for the Cobb County FIS in an effort to resolve the differences in the two flow sources for that project. This email exchange is included in the Appendix for reference. The USGS recommends the use of the current urban regression equations, although a proposal to revise these equations using a multi-state approach is being developed. This direction, along with the calculated impervious area and engineering judgment, were used to make the determination for the discharges to be used for this study. The GDOT Office of Bridge Hydraulics was also consulted and concurred with the approach presented in this study.

As previously stated, Noonday Creek is a FEMA studied stream with a regulatory floodway. To model the proposed construction, the existing bridge was widened in the proposed model. The results included in this study support a “no-rise” for this project.

In locating the approach and exit sections, new research detailed in the HEC-RAS Hydraulic Reference Manual, Version 3.1, dated November 2002, Appendix B is utilized. The expansion and contraction ratios used to locate the exit and approach sections are applicable to HEC-2, HEC-RAS and WSPRO models. The resulting coefficients are in the 1.2:1 to 1.5:1 range for expansion and 0.8:1 to 1.4:1 for contraction. These ranges were applied to the average floodplain constriction for both the proposed and existing conditions, yielding an expansion reach length range of 111 ft. to 139 ft. and a contraction reach length range of 74 ft. to 130 ft. The actual exit section is located at river station -630, approximately 630 ft. downstream of the roadway, and the actual approach section is located at river station 1250, approximately 460 ft. upstream of the proposed bridge. The approach and the exit sections were located at narrow floodplain constrictions in lieu of the aforementioned ratios.

As previously stated, on September 21, 2009 (approximately 1:00 pm) the water surface just upstream from the NBL bridge was observed to be even with the manholes in this area. This equates to an elevation of approximately 938.9. A review of the downstream gages at Hawkins Store Road and Shallowford Road shows the flows to be in the range of the 5-year storm. This conclusion is based on a comparison of gage flows at the time of the visit with the urbanized USGS equations using an impervious area of 25%. The HEC-RAS model results are consistent with this observed event without the need for calibration.

Historic Drainage Patterns

The existing channel velocities at the project site for the 50-year and 100-year storm flows are 7.37 ft/s and 7.76 ft/s, respectively. The existing backwater for the 50-year and 100-year storms 0.49 ft and 0.37 ft, respectively. The Manning’s “n” values for the project site were developed using methods described in the USGS publication, *Guide for Selecting Manning’s Roughness*

Backwater decreases for higher storms

Coefficients for Natural Channels and Flood Plains, by George J. Arcement, Jr. and Verne R. Schneider.

Proposed Drainage Patterns

The proposed bridge widening results in a negligible change in the velocity and backwater values. The proposed channel velocities for the 50-year and 100-year storm flows are 7.37 ft/s and 7.76 ft/s, respectively. The existing backwater for the 50-year and 100-year storms 0.49 ft and 0.37 ft, respectively.

The maximum calculated contraction and local scour depth in the channel is 16.4 ft for the 100-year flood. The proposed bents are located in close proximity to the channel. Therefore, the channel scour depth was used for all of the bents to account for any local bank instability as was observed at the existing bridge. The existing bridges are founded on spread footings.

Riprap calculations were performed in accordance with the procedures outlined in Hydraulic Engineering Circular No. 23 *Bridge Scour and Stream Instability Countermeasures* the procedures detailed in the above named publication. GDOT Type I riprap 24-inches thick is specified here.

Summary

The appropriate hydraulic and hydrological procedures were used in this study's development. The proposed widening will not encroach vertically or horizontally on the current regulatory floodway elevations or widths for Noonday Creek. Therefore, the proposed construction is consistent with the regulatory floodway and coordination with FEMA is not required. However, since this site is located in the developing area of Cobb County, a "no-rise" certificate was obtained and coordination will be done with the community.

References

JBT utilized the following for this study:

- The Current Georgia Department of Transportation Drainage Manual for Highways with Supplemental guidelines for Hydraulic and Hydrological Studies.
- The United States Geological Survey (USGS) publication, *Techniques for Estimating Magnitude and Frequency of Floods in Rural Basins of Georgia--1993*, Water Resources Investigations Report 93-4016.
- Hydrologic Engineering Center (HEC) River Analysis System (HEC-RAS), Water-Surface Computational Model Version 4.0, dated March 2008.
- Hydrologic Engineering Center (HEC) River Analysis System (HEC-RAS) Users Manual Version 3.1, dated November 2002.
- Hydrologic Engineering Center (HEC) River Analysis System (HEC-RAS) Hydraulic Reference Manual Version 3.1, dated November 2002.
- Hydraulic Engineering Circular No. 18 (HEC-18) *Evaluating Scour at Bridges*, (FHWA-NHI-01-001), dated May 2001, Fourth Edition.
- Hydraulic Engineering Circular No. 20 (HEC-20) *Stream Stability at Highway Structures* (FHWA-NHI-01-002) dated March 2001, Third Edition.
- Hydraulic Engineering Circular No. 23 (HEC-23) *Bridge Scour and Stream Instability Countermeasures* (FHWA-NHI-01-003) dated March 2001, Second Edition.

- The United States Geological Survey (USGS) publication, *Roughness Characteristics of Natural Channels*, Harry H. Barnes, Jr.—1987 (3rd Printing), Water-Supply Paper 1849.
- The United States Geological Survey (USGS) publication, *Guide for selecting Manning's Roughness Coefficients for Natural Channels and Flood Plains*, George J. Arcement, Jr., and Verne R. Schneider—1992 (2nd Printing); Water-Supply Paper 2339.
- *Computer Assisted Floodplain Hydrology & Hydraulics*, Daniel H. Hoggan, McGraw-Hill, New York, 1989.

Engineering "No-Rise" Certification

Proposed Bridge Widening over Noonday Creek

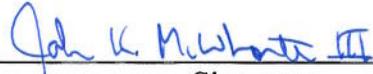
I-75 NBL / GDOT NH000-0073-03(242)

Cobb County, Georgia

This is to certify that I am a duly qualified engineer licensed to practice in the State of Georgia. It is to further certify that the attached technical data supports the fact that the proposed construction of the proposed bridge widening over Noonday Creek will not create any increase to the 100-Year Regulatory flood elevations, Regulatory floodway elevations, and Regulatory floodway widths within acceptable tolerances on Noonday Creek at published sections in the Current Flood Insurance Study for Cobb County, Georgia, and will not create any increase in the Regulatory 100-Year flood and floodway elevations and floodway widths within acceptable tolerances at unpublished cross-sections in the vicinity of the project outside the GDOT R-O-W.

October 18, 2009

Date



Signature

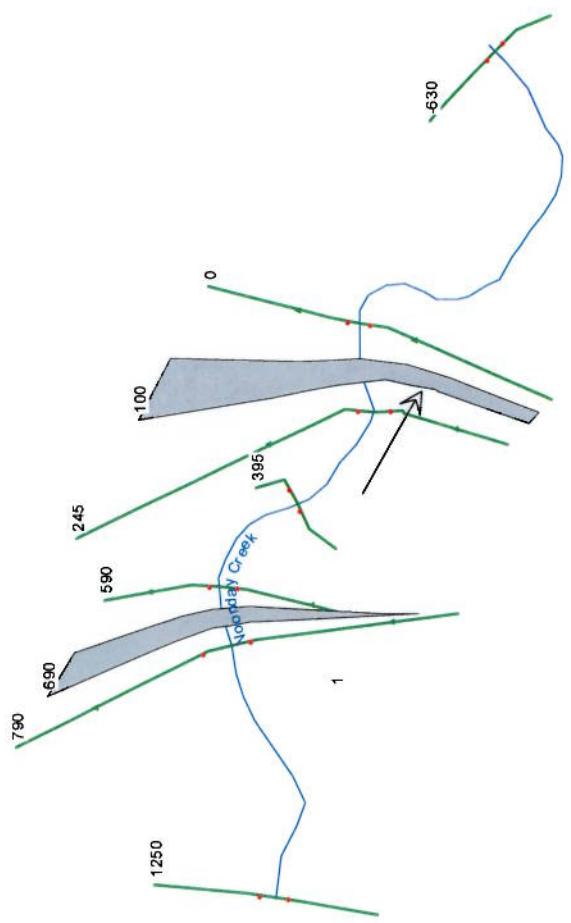
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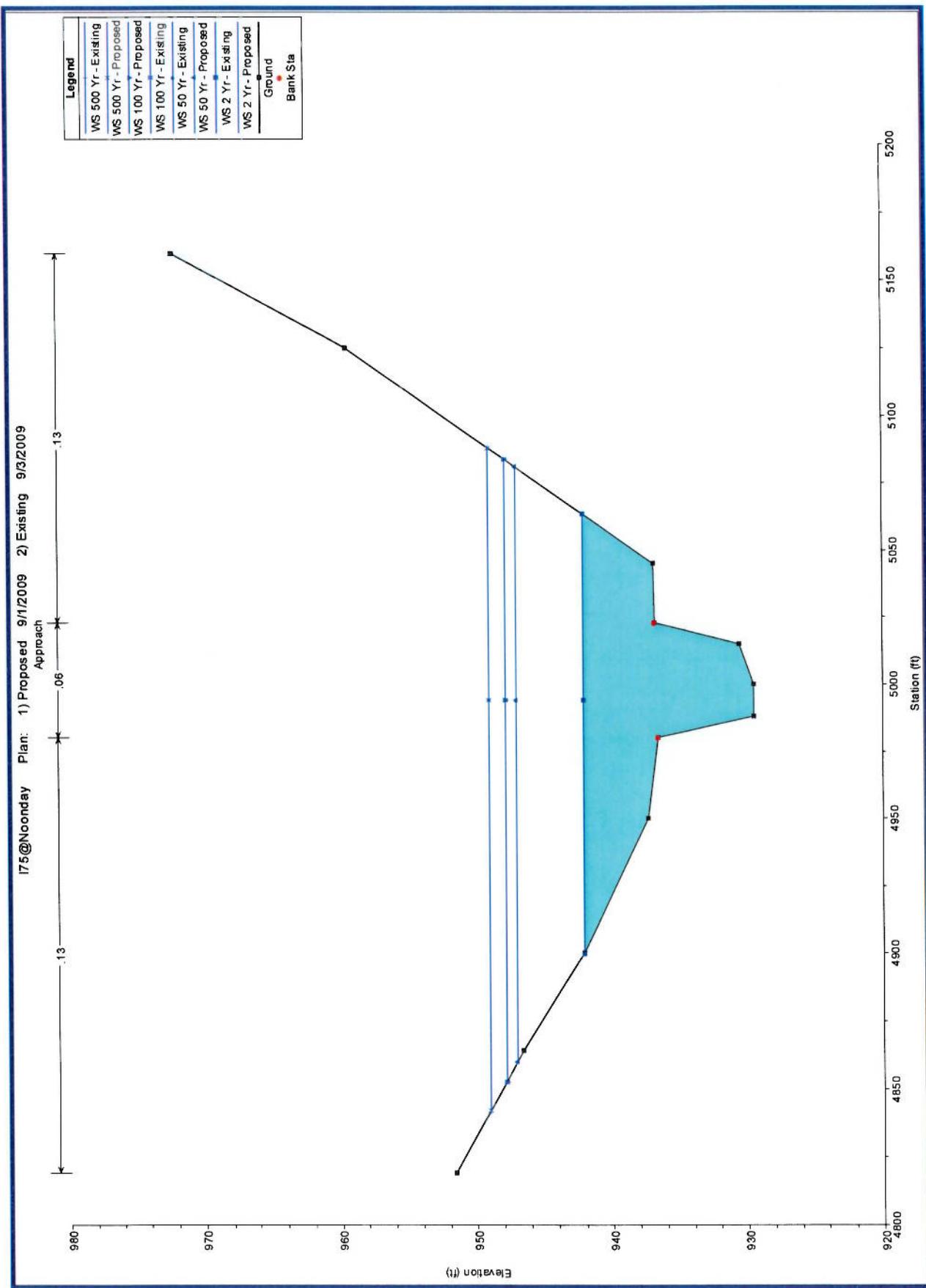


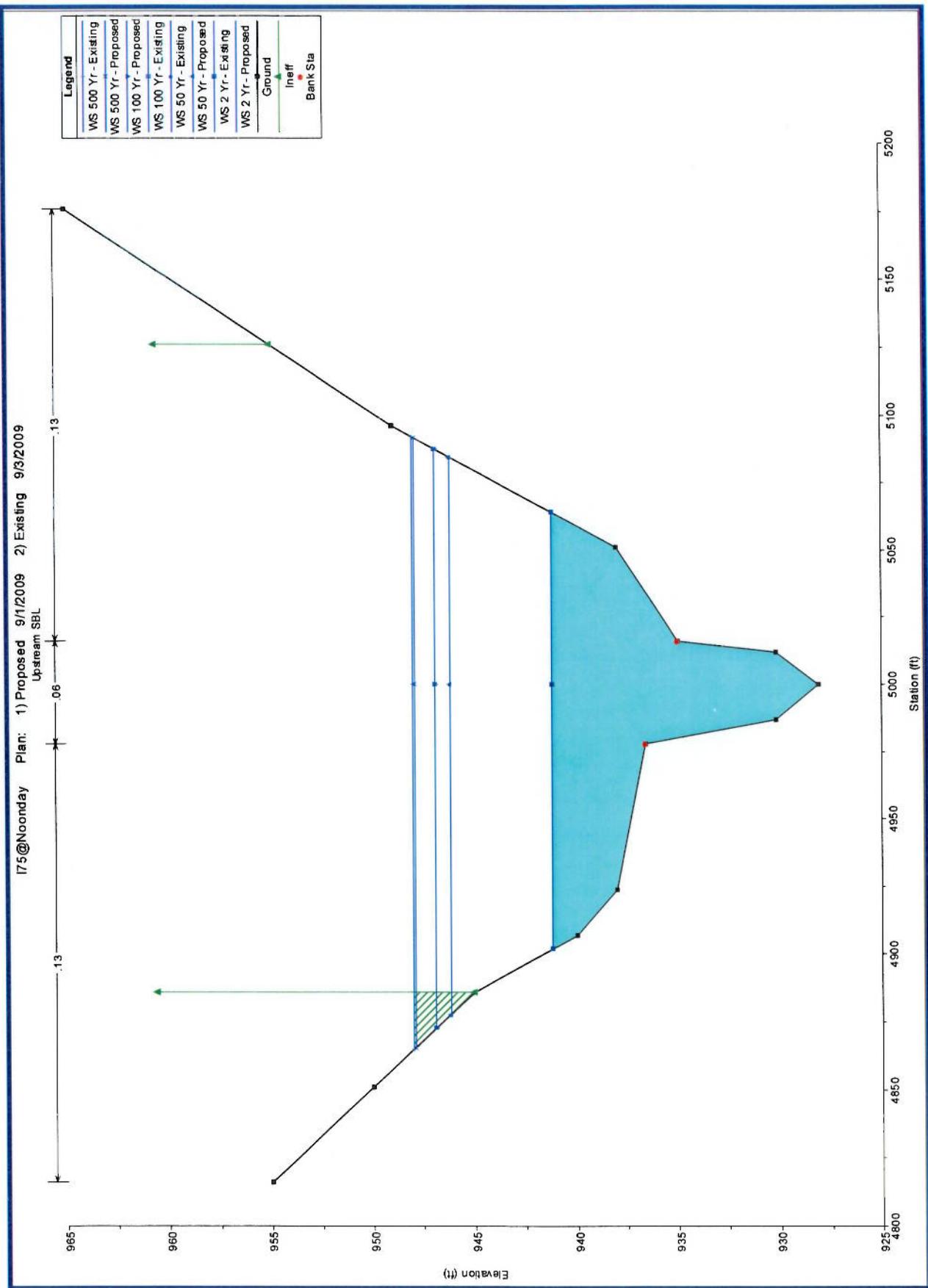
John K. McWhorter III, P.E.
Senior Project Manager

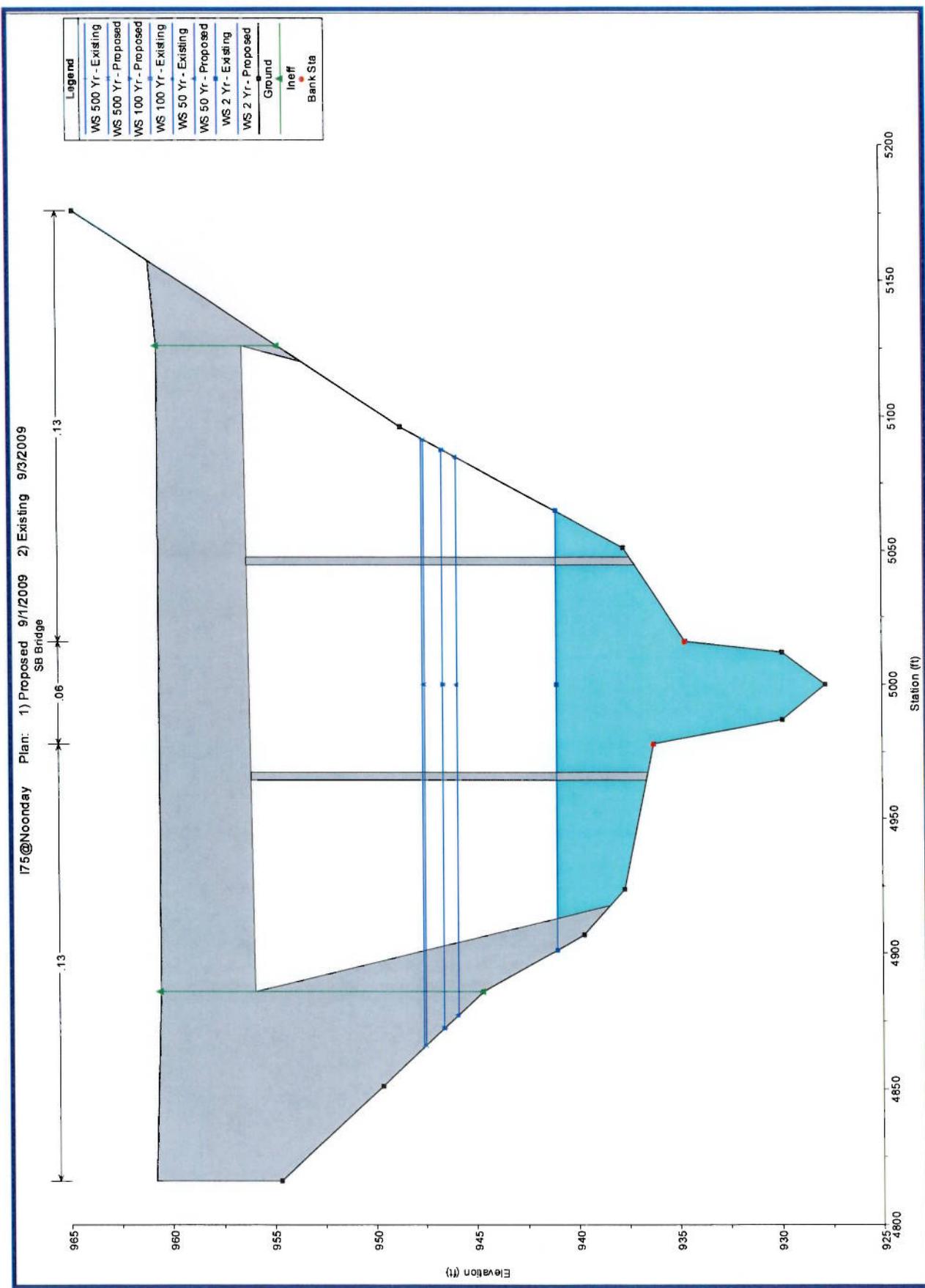
JBT Trimble, Inc.
2550 Heritage Court, SE
Suite 250
Atlanta, Georgia 30339-3062

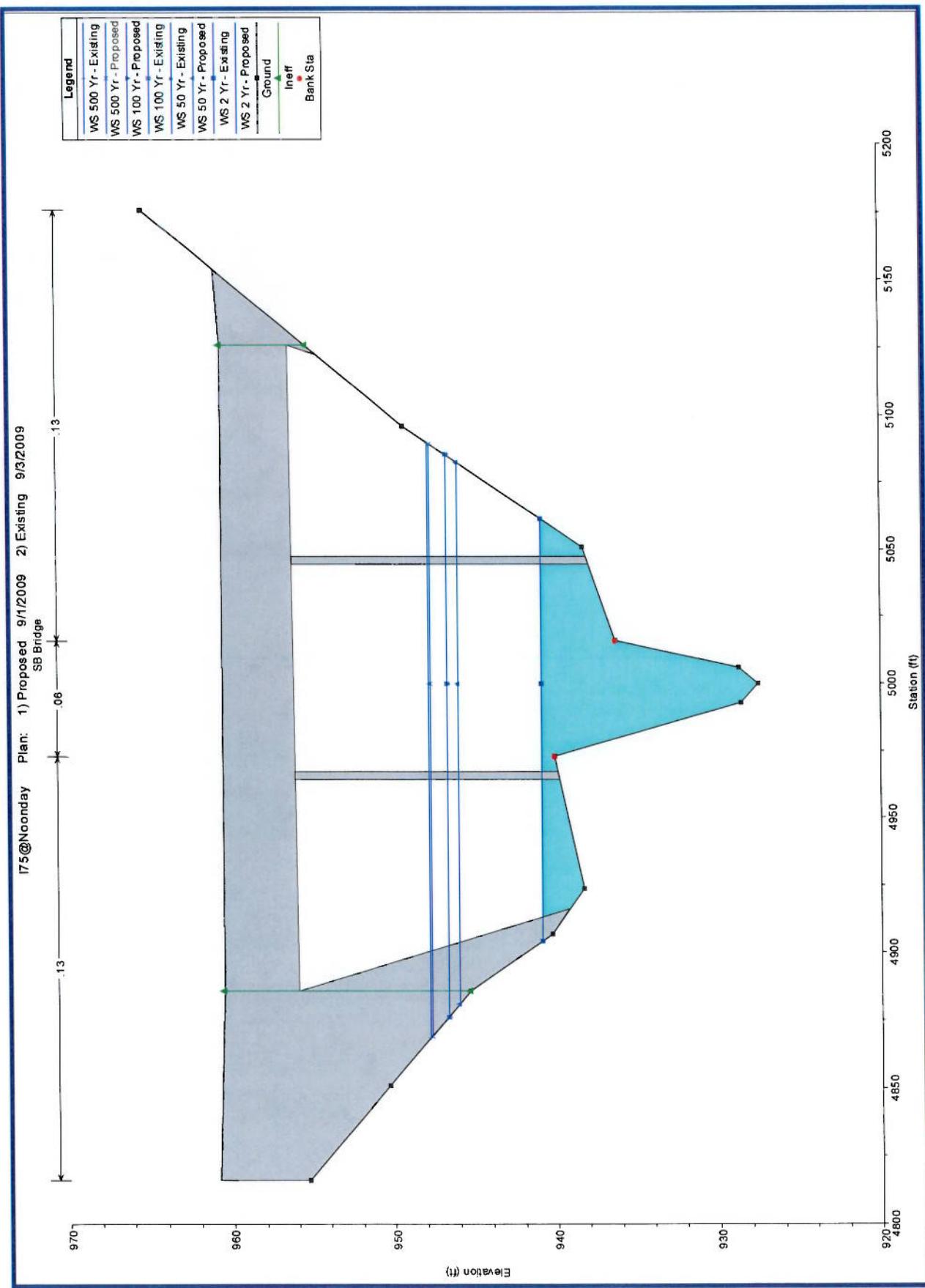
HEC-RAS PLOTS

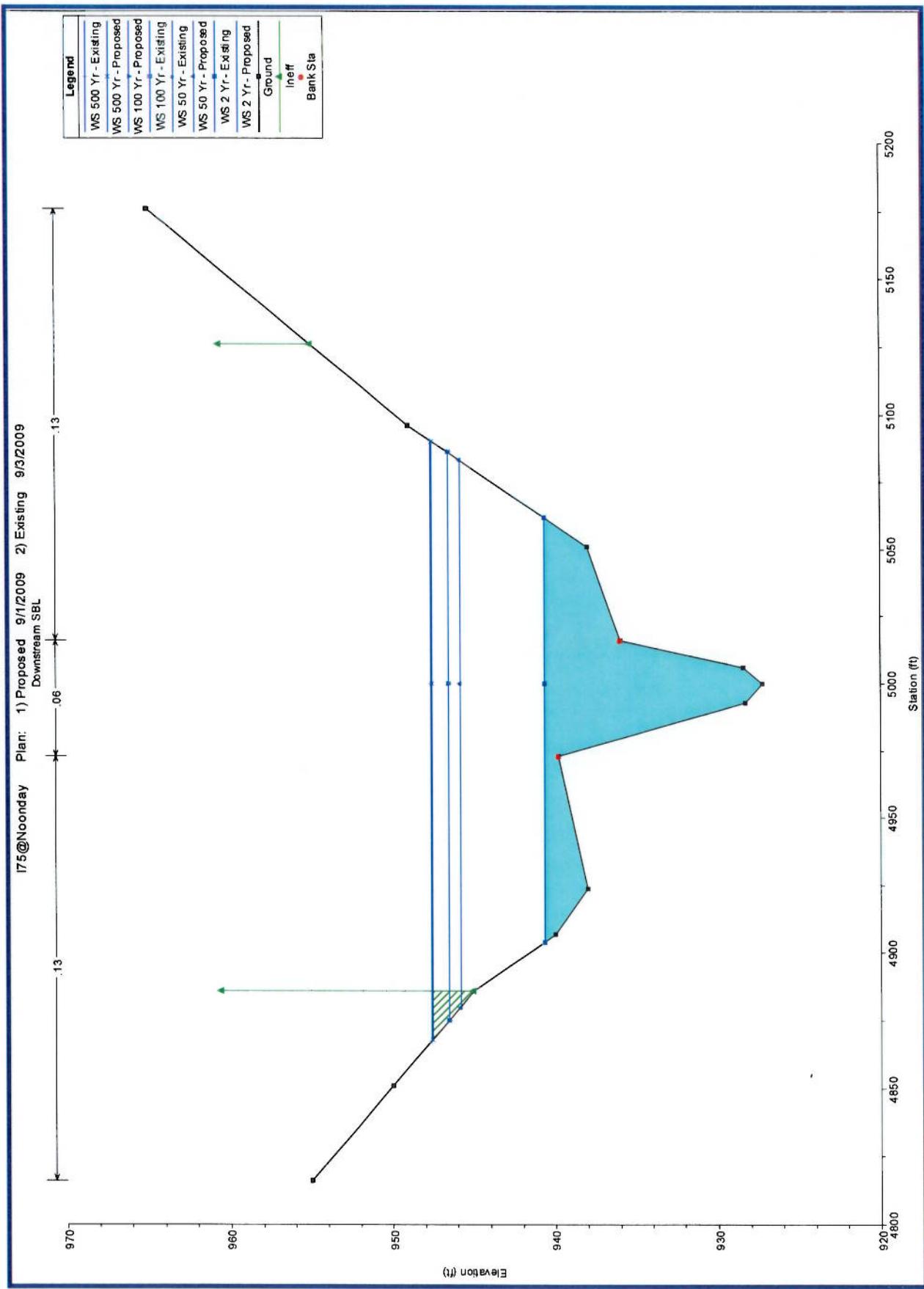


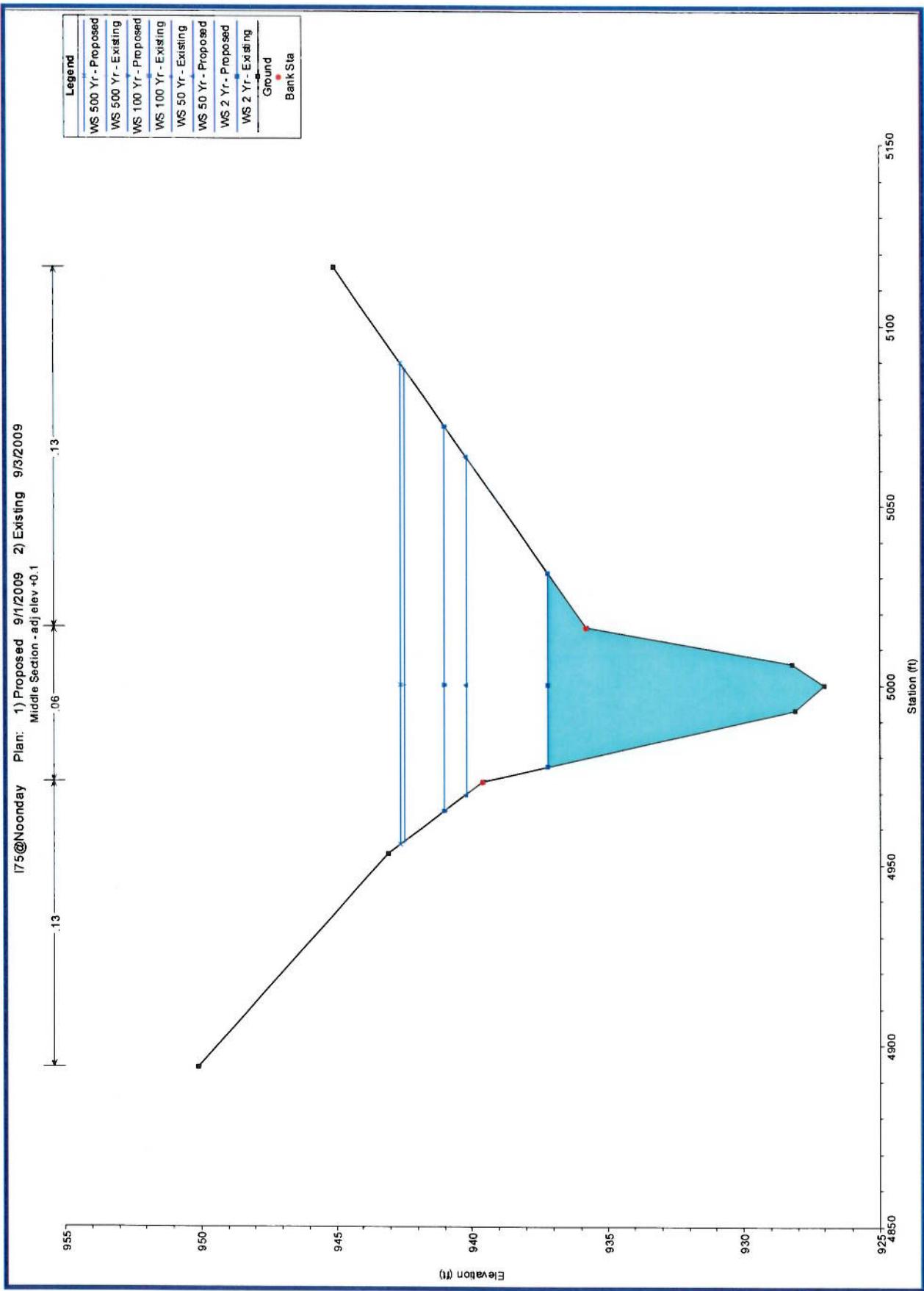


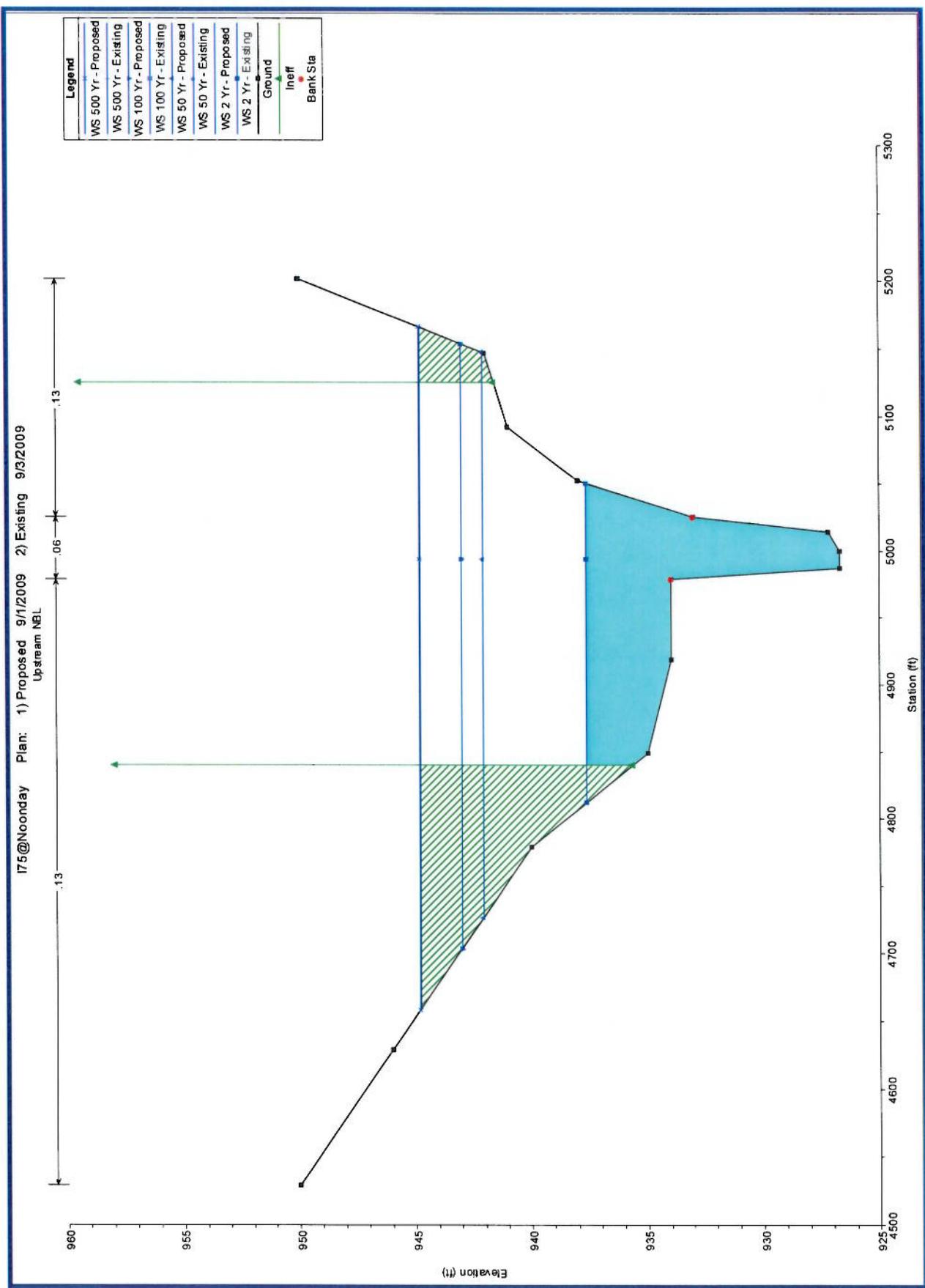


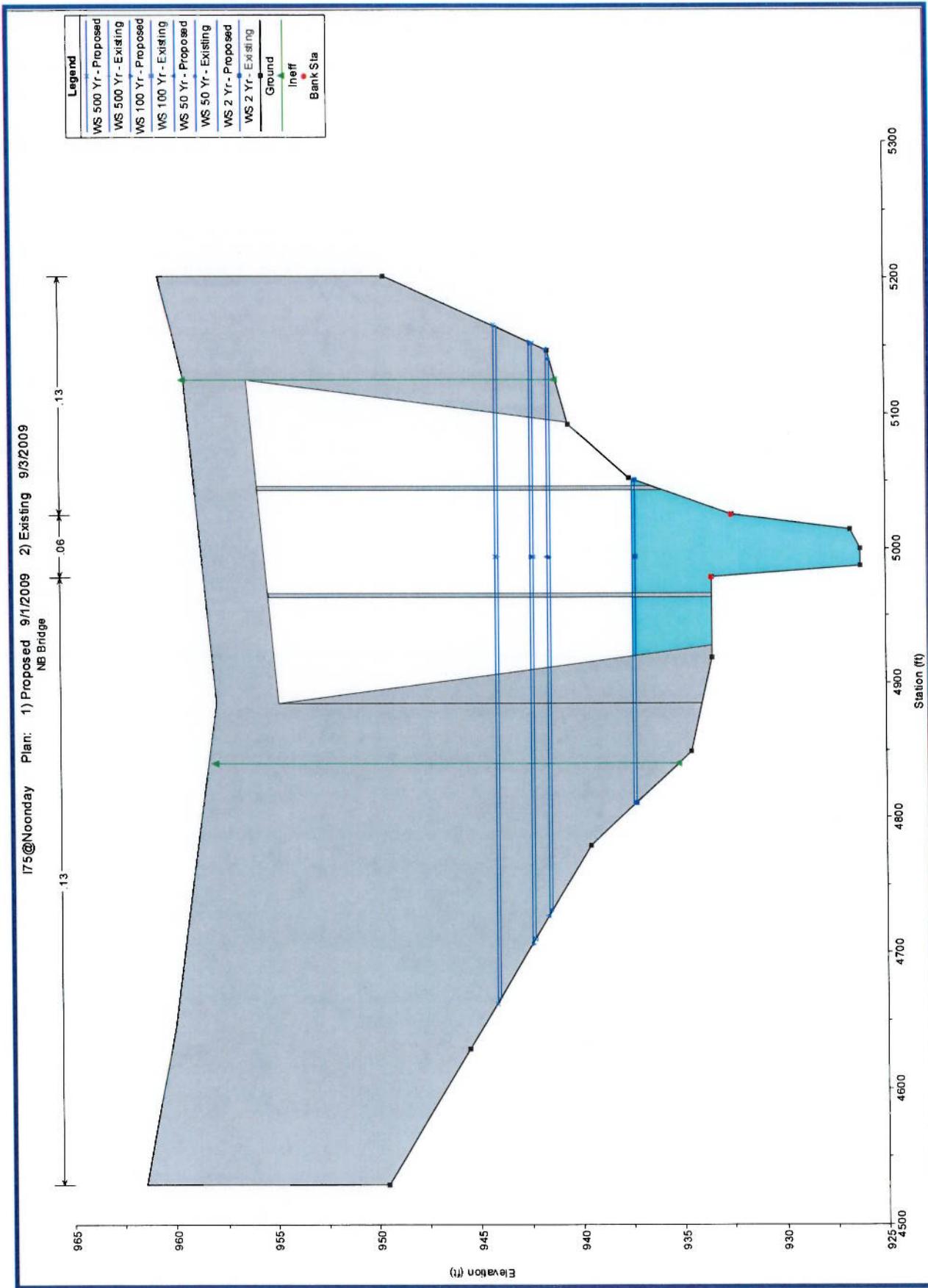


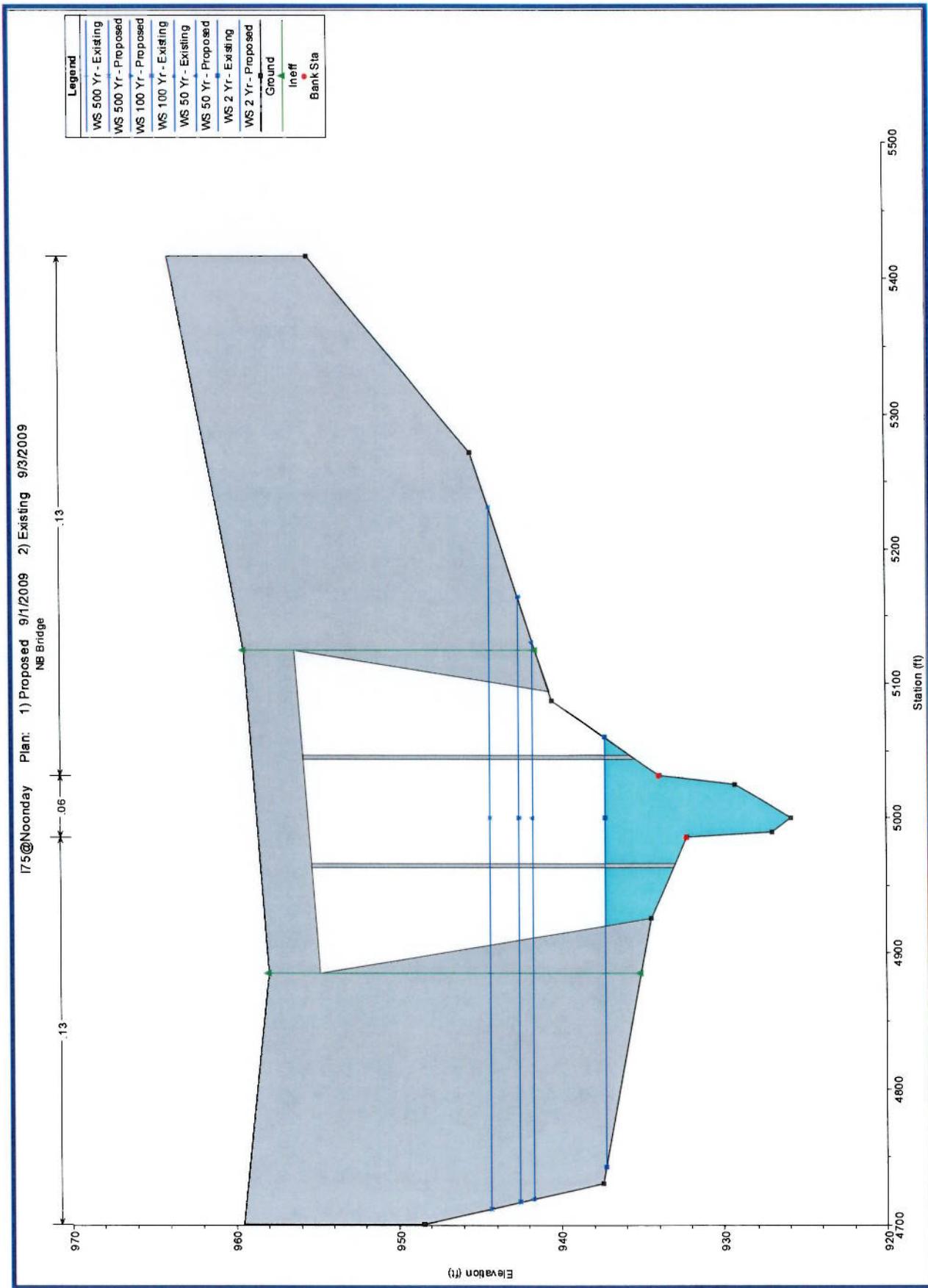


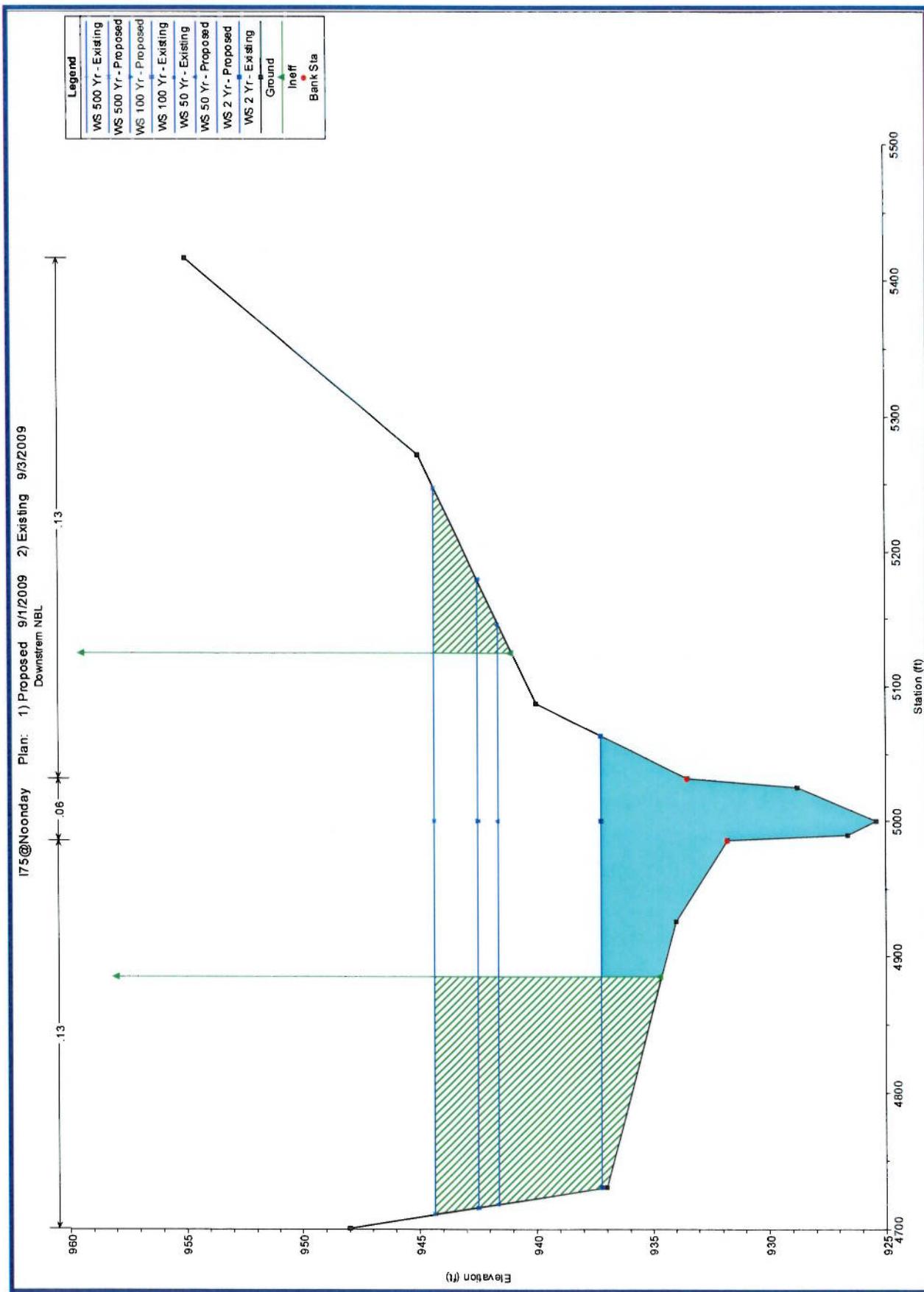


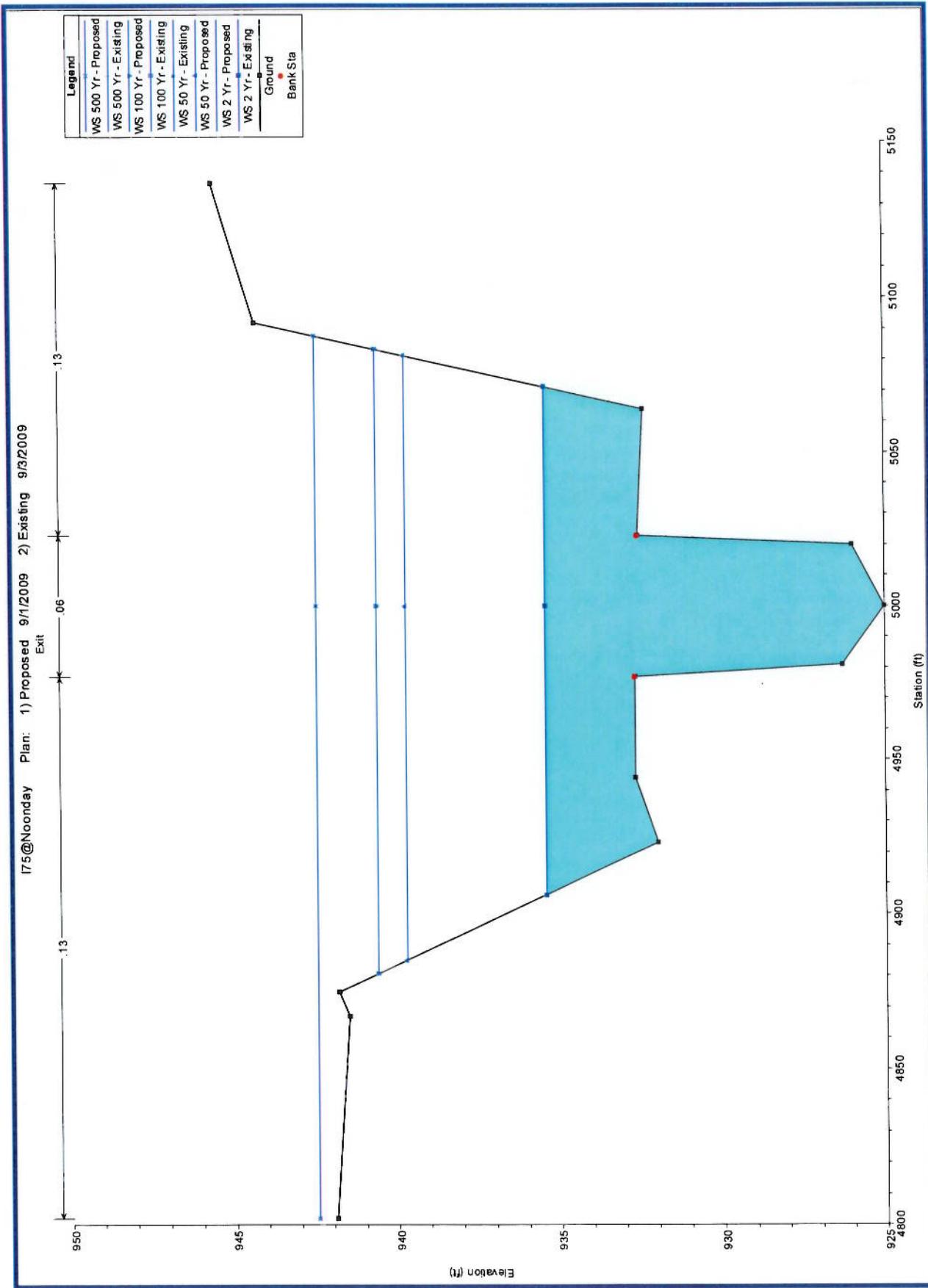












Section II
Hydraulic Tables

HYDRAULIC TABLE (50-YEAR STORM)

	UNCONSTRICTED SECTION	EXISTING CONDITIONS	PROPOSED CONDITIONS
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	941.30	941.59	941.59
FLOODSTAGE ELEVATION APPROACH SECTION (ft)*	946.57	947.06	947.06
AREA OF OPENING UNDER FLOODSTAGE (ft ²)	*****	1382	1382
DISCHARGE THROUGH BRIDGE (cfs)	*****	6003	6003
DISCHARGE OVER ROADWAY (cfs)	*****	0	0
CHANNEL VELOCITY (f/s)	5.19	7.37	7.37
MEAN VELOCITY (f/s)	*****	4.34	4.34
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	937.06	937.19	937.19
BACKWATER HEIGHT (ft)	*****	0.49	0.49

* Approach Section is located upstream of the southbound bridge (Section 1250).

HYDRAULIC TABLE (100-YEAR STORM)

	UNCONSTRICTED SECTION	EXISTING CONDITIONS	PROPOSED CONDITIONS
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	942.19	942.49	942.49
FLOODSTAGE ELEVATION APPROACH SECTION (ft)*	947.49	947.86	947.86
AREA OF OPENING UNDER FLOODSTAGE (ft ²)	*****	1544	1544
DISCHARGE THROUGH BRIDGE (cfs)	*****	6889	6889
DISCHARGE OVER ROADWAY (cfs)	*****	0	0
CHANNEL VELOCITY (f/s)	5.27	7.76	7.76
MEAN VELOCITY (f/s)	*****	4.46	4.46
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	937.06	937.19	937.19
BACKWATER HEIGHT (ft)	*****	0.37	0.37

* Approach Section is located upstream of the southbound bridge (Section 1250).

HYDRAULIC TABLE (500-YEAR STORM)

	UNCONSTRICTED SECTION	EXISTING CONDITIONS	PROPOSED CONDITIONS
FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	944.02	944.33	944.33
FLOODSTAGE ELEVATION APPROACH SECTION (ft)*	948.96	949.10	949.04
AREA OF OPENING UNDER FLOODSTAGE (ft ²)	*****	1881	1881
DISCHARGE THROUGH BRIDGE (cfs)	*****	8519	8519
DISCHARGE OVER ROADWAY (cfs)	*****	0	0
CHANNEL VELOCITY (f/s)	5.18	8.18	8.18
MEAN VELOCITY (f/s)	*****	4.53	4.53
2-YEAR FLOODSTAGE ELEVATION BRIDGE SECTION (ft)	937.06	937.19	937.19
BACKWATER HEIGHT (ft)	*****	0.14	0.08

* Approach Section is located upstream of the southbound bridge (Section 1250).

*NH000-0073-03(242) Cobb County
I-75 over Noonday Creek*

Proposed widened bridges

MIN PROFILE GRADE ELEVATION	949.85
DEPTH OF CROSS SLOPE	0.84
DEPTH OF SLAB AND BEAM	5.06

BOTTOM OF BEAM ELEVATION	943.95
--------------------------	--------

MINIMUM BOTTOM OF BEAM ELEVATION	943.95
50 YEAR FLOODSTAGE ELEVATION*	941.59

CLEARANCE	2.36
-----------	------

MINIMUM BOTTOM OF BEAM ELEVATION	943.95
100 YEAR FLOODSTAGE ELEVATION*	942.49

CLEARANCE	1.46
-----------	------

*Floodstage taken from proposed conditions model.

TABLE OF 100 YR FLOODWAY ELEVATIONS

NOONDAY CREEK

COBB COUNTY, GA

CROSS SECTION	PUBLISHED ELEVATION*	DUPLICATE ELEVATION	CORRECTED ELEVATION	EXISTING ELEVATION	PROPOSED ELEVATION	DELTA (E-D)
28275.58 - X	935.3	935.3	935.3	935.3	935.3	0.0
29014.22		939.5	939.5	939.5	939.5	0.0
29655.01 - Y	941.1	941.1	941.1	941.1	941.1	0.0
30358.55		941.4	941.4	941.4	941.4	0.0
31128.08		941.3	941.3	941.3	941.3	0.0
31244.21BR D		942.5	942.5	942.5	942.5	0.0
31244.21BR U		942.8	942.8	942.8	942.8	0.0
31353.71 - Z	943.1	943.1	943.1	943.1	943.1	0.0
32008.58		946.6	946.6	946.6	946.6	0.0
32395.49BR D		946.8	946.8	946.8	946.8	0.0
32395.49BR U		946.8	946.8	946.8	946.8	0.0
32499.49		946.7	946.7	946.7	946.7	0.0
32836.11		946.9	946.9	946.9	946.8	0.0
32909.32		948.1	948.1	948.1	948.1	0.0
32976.16BR D		948.1	948.1	948.1	948.1	0.0
32976.16BR U		948.2	948.2	948.2	948.2	0.0
33046.16 - AA	948.2	948.2	948.2	948.2	948.2	0.0
33155.58		948.1	948.1	948.1	948.1	0.0
34068.65		950.1	950.1	950.1	950.1	0.0
34164.15		950.2	950.2	950.2	950.2	0.0
34319.79 - AB	952.6	952.6	952.6	952.6	952.6	0.0
34887.32		953.1	953.1	953.1	953.1	0.0
35731.12 - AC	953.6	953.6	953.6	953.6	953.6	0.0
36431.22		953.9	953.9	953.9	953.9	0.0
36570.11		953.9	953.9	953.9	953.9	0.0

NOTES:

- 1) Bold rows indicate published cross-sections.
- 2) Hi-lighted rows indicate cross-sections within the R-O-W.
- 3) Elevations retrieved from Table 200 in Floodway Models

* The results are based on the latest model revision scheduled for an effective date of December '08.

TABLE OF 100 YR FLOOD ELEVATIONS

NOONDAY CREEK

COBB COUNTY, GA

CROSS SECTION	A PUBLISHED ELEVATION*	B DUPLICATE ELEVATION	C CORRECTED ELEVATION	D EXISTING ELEVATION	E PROPOSED ELEVATION	F DELTA (E-D)
28275.58 - X	934.9	934.9	934.9	934.9	934.9	0.0
29014.22		939.4	939.4	939.4	939.4	0.0
29655.01 - Y	940.9	940.9	940.9	940.9	940.9	0.0
30358.55		941.1	941.1	941.1	941.1	0.0
31128.08		940.6	940.6	940.6	940.6	0.0
31244.21BR D		942.2	942.2	942.2	942.2	0.0
31244.21BR U		942.6	942.6	942.6	942.6	0.0
31353.71 - Z	942.1	942.1	942.1	942.1	942.1	0.0
32008.58		945.8	945.8	945.8	945.8	0.0
32395.49BR D		946.1	946.1	946.1	946.1	0.0
32395.49BR U		946.1	946.1	946.1	946.1	0.0
32499.49		946.0	946.0	946.0	946.0	0.0
32836.11		946.2	946.2	946.2	946.2	0.0
32909.32		947.8	947.8	947.8	947.8	0.0
32976.16BR D		947.8	947.8	947.8	947.8	0.0
32976.16BR U		947.9	947.9	947.9	947.9	0.0
33046.16 - AA	947.9	947.9	947.9	947.9	947.9	0.0
33155.58		947.8	947.8	947.8	947.8	0.0
34068.65		949.7	949.7	949.7	949.7	0.0
34164.15		949.8	949.8	949.8	949.8	0.0
34319.79 - AB	952.3	952.3	952.3	952.3	952.3	0.0
34887.32		952.8	952.8	952.8	952.8	0.0
35731.12 - AC	953.1	953.1	953.1	953.1	953.1	0.0
36431.22		953.4	953.4	953.4	953.4	0.0
36570.11		953.4	953.4	953.4	953.4	0.0

Section III
Peak Flow Summary

**NH000-0073-03(242) Cobb County
I-75 over Noonday Creek
PI # 714130**

Drainage Area (sq. mi.) 11.0
 Region No. 1

Impervious Area (%) 25

USGS Gage No.	N/A	FEMA Discharges @ BR
Drainage Area @ Gage		
Q2		-
Q5		-
Q10		4744
Q25		5760
Q50		6544
Q100		7348
Q500		8985

Discharge (cfs)

	Regional	Urbanized	Weighted Discharge	Qu(w)
Q2	993	2608		0
Q5	1625	3814		0
Q10	2127	4266		0
Q25	2841	5375		0
Q50	3445	6003		0
Q100	4097	6889		0
Q500	5902	8519		0

Hydraulic Slope Calculation

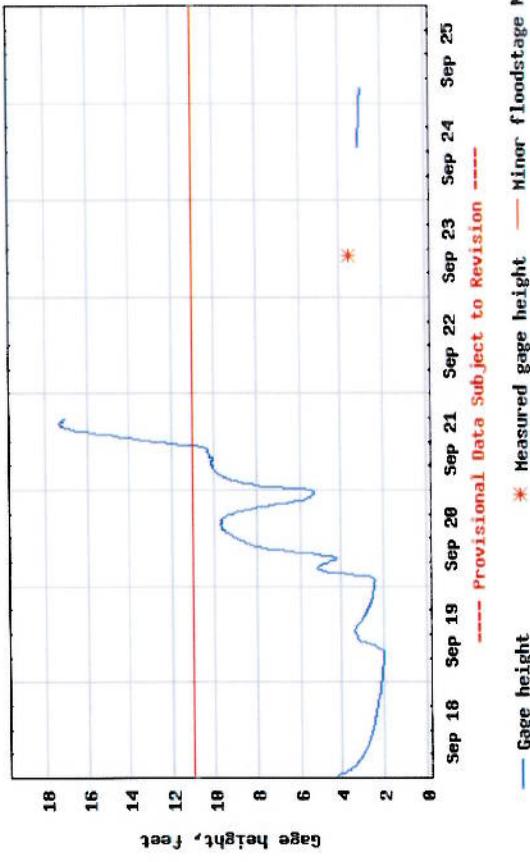
Based on USGS quad

Upstream Elevation = 940
 Downstream Elevation = 920
 Horizontal Distance = 7025

Slope = 0.00285 ft/ft
 15.03 ft/mi

NH000-0073-03(242) Cobb County
Hawkins Store Road over Noontday Creek (downstream of project)
 PI # 714130

USGS 02392950 NOONDAY CREEK AT HAWKINS STORE RD, NR WOODSTOCK, GA

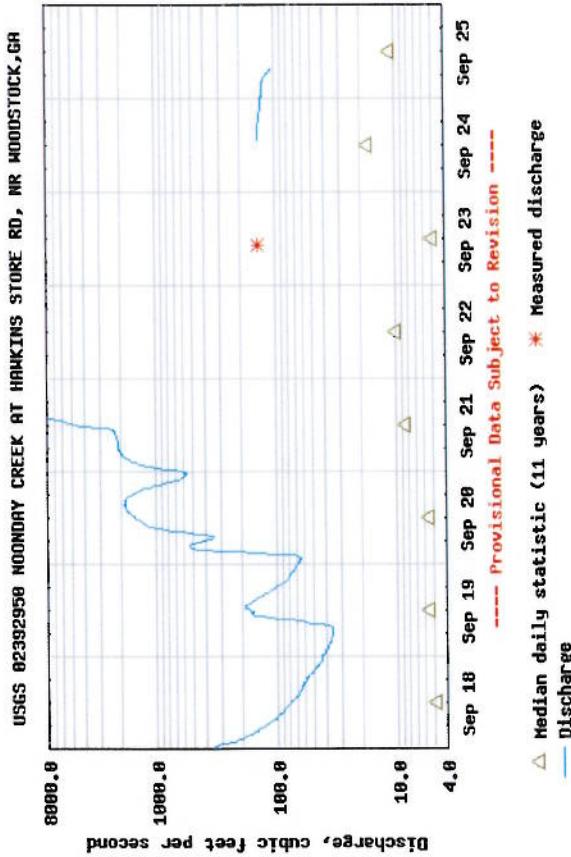


Regional	Discharge (cfs)	Urbanized	Qu(w)	Weighted Discharge
Q2	1668	4651	0	0
Q5	2681	6696	0	0
Q10	3473	7429	0	0
Q25	4590	9361	0	0
Q50	5520	10373	0	0
Q100	6509	11903	0	0
Q500	9221	14604	0	0

Hydraulic Slope Calculation
Based on USGS quad

Upstream Elevation = 940
 Downstream Elevation = 920
 Horizontal Distance = 7025

$$\text{Slope} = \frac{0.00285 \text{ ft/ft}}{15.03 \text{ ft/m}}$$



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# ----- WARNING -----
# The data you have obtained from this automated U.S. Geological Survey database
# have not received Director's approval and as such are provisional and subject to
# revision. The data are released on the condition that neither the USGS nor the
# United States Government may be held liable for any damages resulting from its use.
# Additional info: http://waterdata.usgs.gov/nwis/help/?provisional
#
# File-format description: http://waterdata.usgs.gov/nwis/?tab_delimited_format_info
# Automated-retrieval info: http://waterdata.usgs.gov/nwis/?automated_retrieval_info
#
# Contact: gs-w_support_nwisweb@usgs.gov
# retrieved: 2009-09-25 09:22:19 EDT
#
# Data for the following site(s) are contained in this file
#     USGS 02392950 NOONDAY CREEK AT HAWKINS STORE RD, NR WOODSTOCK, GA
# -----
#
# Data provided for site 02392950
#   DD parameter    Description
#   01    00065      Gage height, feet
#   02    00060      Discharge, cubic feet per second
#


| agency_cd | site_no  | datetime         | 01_00065 | 01_00065_cd | 02_00060 | 02_00060 |
|-----------|----------|------------------|----------|-------------|----------|----------|
| 5s        | 15s      | 16d              | 14n 10s  | 14n 10s     |          |          |
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| USGS      | 02392950 | 2009-09-18 00:15 | 4.26     | 342         |          |          |
| USGS      | 02392950 | 2009-09-18 00:30 | 4.22     | 334         |          |          |
| USGS      | 02392950 | 2009-09-18 00:45 | 4.15     | 319         |          |          |
| USGS      | 02392950 | 2009-09-18 01:00 | 4.05     | 297         |          |          |
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| USGS      | 02392950 | 2009-09-18 01:30 | 3.79     | 247         |          |          |
| USGS      | 02392950 | 2009-09-18 01:45 | 3.70     | 232         |          |          |
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| USGS      | 02392950 | 2009-09-18 04:30 | 3.17     | 150         |          |          |
| USGS      | 02392950 | 2009-09-18 04:45 | 3.14     | 147         |          |          |
| USGS      | 02392950 | 2009-09-18 05:00 | 3.11     | 143         |          |          |
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| USGS      | 02392950 | 2009-09-18 05:30 | 3.05     | 136         |          |          |
| USGS      | 02392950 | 2009-09-18 05:45 | 3.02     | 132         |          |          |
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| USGS      | 02392950 | 2009-09-18 09:00 | 2.73     | 95          |          |          |
| USGS      | 02392950 | 2009-09-18 09:15 | 2.72     | 94          |          |          |
| USGS      | 02392950 | 2009-09-18 09:30 | 2.69     | 91          |          |          |
| USGS      | 02392950 | 2009-09-18 09:45 | 2.68     | 90          |          |          |


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USGS	02392950	2009-09-20 15:45	9.72	1860
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USGS	02392950	2009-09-20 16:45	9.63	1820
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USGS	02392950	2009-09-20 20:45	6.72	876
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USGS	02392950	2009-09-20 21:15	6.13	747
USGS	02392950	2009-09-20 21:30	5.91	699
USGS	02392950	2009-09-20 21:45	5.70	651
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USGS	02392950	2009-09-20 22:15	5.50	607
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USGS	02392950	2009-09-21 00:30	6.49	825
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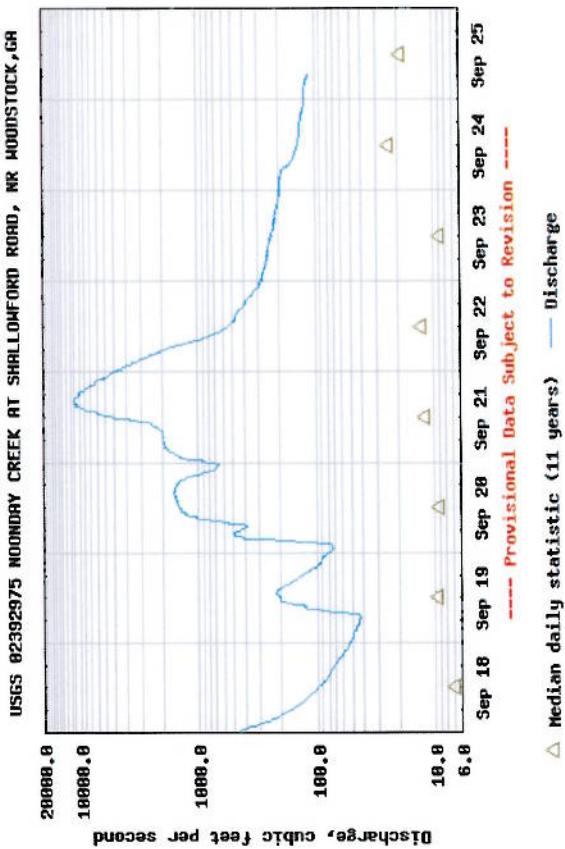
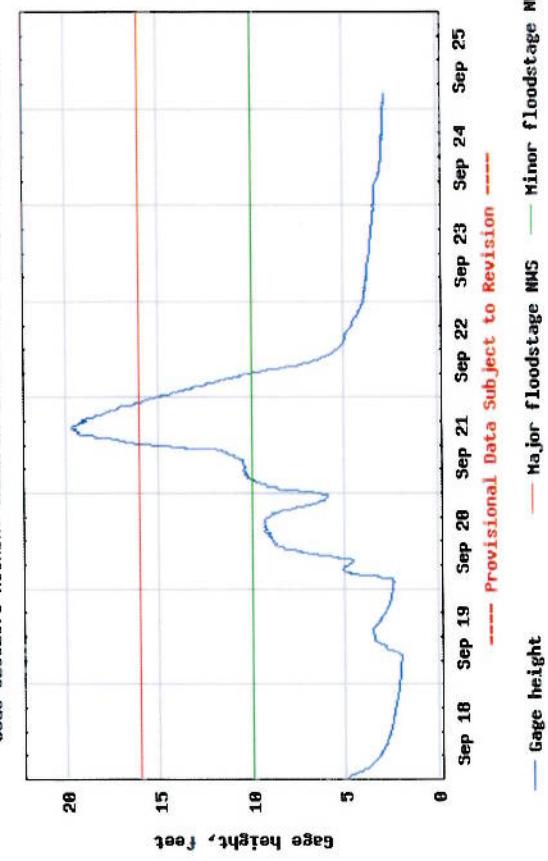
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	02392950	2009-09-25 06:30	2.88	113
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USGS	02392950	2009-09-25 08:00	2.81	105

NH000-0073-03(242) Cobb County
Shallowford Road over Noonday Creek (downstream of project)
 PI # 714130

Drainage Area (sq. mi.)	33.6
Region No.	1
Impervious Area (%)	25
USGS Gage No.	N/A
Drainage Area @ Gage	FEMA Discharges
Q2	9842
Q5	14758
Q10	16834
Q25	21406
Q50	
Q100	
Q500	

USGS 82392975 NOONDAY CREEK AT SHALLOWFORD ROAD, NR WOODSTOCK, GA



Regional	Discharge (cfs)	Urbanized	Qu(w)	Weighted Discharge
Q2	2062	5893	0	0
Q5	3291	8428	0	0
Q10	4245	9321	0	0
Q25	5584	11745	0	0
Q50	6694	12972	0	0
Q100	7865	14886	0	0
Q500	11067	18204	0	0

Hydraulic Slope Calculation
Based on USGS quad

Upstream Elevation = 940
 Downstream Elevation = 920
 Horizontal Distance = 7025

$$\text{Slope} = \frac{0.00285 \text{ ft/ft}}{15.03 \text{ ft/mi}}$$

```

# ----- WARNING -----
# The data you have obtained from this automated U.S. Geological Survey database
# have not received Director's approval and as such are provisional and subject to
# revision. The data are released on the condition that neither the USGS nor the
# United States Government may be held liable for any damages resulting from its use.
# Additional info: http://waterdata.usgs.gov/ga/nwis/help/?provisional
#
# File-format description: http://waterdata.usgs.gov/nwis/?tab_delimited_format_info
# Automated-retrieval info: http://waterdata.usgs.gov/nwis/?automated_retrieval_info
#
# Contact: gs-w_support_nwisweb@usgs.gov
# retrieved: 2009-09-25 08:12:49 EDT
#
# Data for the following site(s) are contained in this file
# USGS 02392975 NOONDAY CREEK AT SHALLOWFORD ROAD, NR WOODSTOCK, GA
# -----
#
# Data provided for site 02392975
#   DD parameter Description
#   01    00065    Gage height, feet
#   02    00060    Discharge, cubic feet per second
#   13    00045    Precipitation, total, inches
#

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USGS	02392975	2009-09-19 07:45	2.08	51	0.00
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USGS	02392975	2009-09-19 08:15	2.32	72	0.05
USGS	02392975	2009-09-19 08:30	2.47	87	0.20
USGS	02392975	2009-09-19 08:45	2.63	104	0.08
USGS	02392975	2009-09-19 09:00	2.76	121	0.00
USGS	02392975	2009-09-19 09:15	2.81	127	0.00
USGS	02392975	2009-09-19 09:30	2.82	128	0.01
USGS	02392975	2009-09-19 09:45	2.79	124	0.02
USGS	02392975	2009-09-19 10:00	2.89	135	0.01
USGS	02392975	2009-09-19 10:15	3.00	149	0.00
USGS	02392975	2009-09-19 10:30	3.16	170	0.00
USGS	02392975	2009-09-19 10:45	3.30	190	0.01
USGS	02392975	2009-09-19 11:00	3.39	201	0.00
USGS	02392975	2009-09-19 11:15	3.41	204	0.00
USGS	02392975	2009-09-19 11:30	3.40	202	0.00
USGS	02392975	2009-09-19 11:45	3.39	201	0.01
USGS	02392975	2009-09-19 12:00	3.40	202	0.02
USGS	02392975	2009-09-19 12:15	3.42	205	0.02
USGS	02392975	2009-09-19 12:30	3.44	208	0.01
USGS	02392975	2009-09-19 12:45	3.49	215	0.00
USGS	02392975	2009-09-19 13:00	3.52	219	0.00
USGS	02392975	2009-09-19 13:15	3.53	221	0.00
USGS	02392975	2009-09-19 13:30	3.51	218	0.00
USGS	02392975	2009-09-19 13:45	3.50	216	0.00
USGS	02392975	2009-09-19 14:00	3.47	212	0.00
USGS	02392975	2009-09-19 14:15	3.42	205	0.00
USGS	02392975	2009-09-19 14:30	3.38	200	0.00
USGS	02392975	2009-09-19 14:45	3.33	194	0.01
USGS	02392975	2009-09-19 15:00	3.30	190	0.00
USGS	02392975	2009-09-19 15:15	3.24	181	0.00
USGS	02392975	2009-09-19 15:30	3.20	176	0.00
USGS	02392975	2009-09-19 15:45	3.16	170	0.00
USGS	02392975	2009-09-19 16:00	3.11	164	0.00
USGS	02392975	2009-09-19 16:15	3.09	161	0.00
USGS	02392975	2009-09-19 16:30	3.05	156	0.00
USGS	02392975	2009-09-19 16:45	3.02	152	0.00
USGS	02392975	2009-09-19 17:00	2.98	147	0.00
USGS	02392975	2009-09-19 17:15	2.95	143	0.00
USGS	02392975	2009-09-19 17:30	2.93	140	0.00

USGS	02392975	2009-09-19 17:45	2.87	134	0.00
USGS	02392975	2009-09-19 18:00	2.85	132	0.00
USGS	02392975	2009-09-19 18:15	2.83	129	0.00
USGS	02392975	2009-09-19 18:30	2.78	123	0.00
USGS	02392975	2009-09-19 18:45	2.76	121	0.00
USGS	02392975	2009-09-19 19:00	2.73	117	0.00
USGS	02392975	2009-09-19 19:15	2.71	114	0.00
USGS	02392975	2009-09-19 19:30	2.69	111	0.00
USGS	02392975	2009-09-19 19:45	2.66	108	0.00
USGS	02392975	2009-09-19 20:00	2.62	104	0.00
USGS	02392975	2009-09-19 20:15	2.61	103	0.00
USGS	02392975	2009-09-19 20:30	2.58	99	0.00
USGS	02392975	2009-09-19 20:45	2.57	98	0.00
USGS	02392975	2009-09-19 21:00	2.57	98	0.00
USGS	02392975	2009-09-19 21:15	2.54	94	0.00
USGS	02392975	2009-09-19 21:30	2.53	93	0.00
USGS	02392975	2009-09-19 21:45	2.52	92	0.00
USGS	02392975	2009-09-19 22:00	2.52	92	0.00
USGS	02392975	2009-09-19 22:15	2.51	91	0.00
USGS	02392975	2009-09-19 22:30	2.49	89	0.01
USGS	02392975	2009-09-19 22:45	2.50	90	0.00
USGS	02392975	2009-09-19 23:00	2.47	87	0.00
USGS	02392975	2009-09-19 23:15	2.46	86	0.00
USGS	02392975	2009-09-19 23:30	2.45	84	0.00
USGS	02392975	2009-09-19 23:45	2.44	83	0.00
USGS	02392975	2009-09-20 00:00	2.43	78	0.00
USGS	02392975	2009-09-20 00:15	2.42	77	0.00
USGS	02392975	2009-09-20 00:30	2.41	76	0.00
USGS	02392975	2009-09-20 00:45	2.40	75	0.00
USGS	02392975	2009-09-20 01:00	2.40	75	0.01
USGS	02392975	2009-09-20 01:15	2.37	72	0.05
USGS	02392975	2009-09-20 01:30	2.39	74	0.06
USGS	02392975	2009-09-20 01:45	2.39	74	0.02
USGS	02392975	2009-09-20 02:00	2.40	75	0.00
USGS	02392975	2009-09-20 02:15	2.42	77	0.00
USGS	02392975	2009-09-20 02:30	2.47	82	0.00
USGS	02392975	2009-09-20 02:45	2.80	122	0.00
USGS	02392975	2009-09-20 03:00	3.26	183	0.00
USGS	02392975	2009-09-20 03:15	3.26	183	
USGS	02392975	2009-09-20 03:30	3.82	264	0.00
USGS	02392975	2009-09-20 03:45	4.69	411	0.00
USGS	02392975	2009-09-20 04:00	4.69	411	0.00
USGS	02392975	2009-09-20 04:15	4.90	450	0.00
USGS	02392975	2009-09-20 04:30	5.05	479	0.00
USGS	02392975	2009-09-20 04:45	5.11	491	0.00
USGS	02392975	2009-09-20 05:00	5.12	493	0.00
USGS	02392975	2009-09-20 05:15	5.06	481	0.00
USGS	02392975	2009-09-20 05:30	5.00	469	0.00
USGS	02392975	2009-09-20 05:45	4.90	450	0.03
USGS	02392975	2009-09-20 06:00	4.80	431	0.14
USGS	02392975	2009-09-20 06:15	4.71	414	0.10
USGS	02392975	2009-09-20 06:30	4.64	402	0.01
USGS	02392975	2009-09-20 06:45	4.58	391	0.01
USGS	02392975	2009-09-20 07:00	4.52	380	0.16
USGS	02392975	2009-09-20 07:15	4.56	387	0.11
USGS	02392975	2009-09-20 07:30	4.73	418	0.04
USGS	02392975	2009-09-20 07:45	5.36	542	
USGS	02392975	2009-09-20 08:00	5.36	542	
USGS	02392975	2009-09-20 08:15	6.05	692	0.41
USGS	02392975	2009-09-20 08:30	6.05	692	0.00
USGS	02392975	2009-09-20 08:45	6.84	886	0.03
USGS	02392975	2009-09-20 09:00	7.17	971	0.05
USGS	02392975	2009-09-20 09:15	7.42	1040	0.36
USGS	02392975	2009-09-20 09:30	7.42	1040	0.00

USGS	02392975	2009-09-20 09:45	7.87	1160	0.14
USGS	02392975	2009-09-20 10:00	8.28	1270	0.12
USGS	02392975	2009-09-20 10:15	8.28	1270	0.00
USGS	02392975	2009-09-20 10:30	8.38	1300	0.05
USGS	02392975	2009-09-20 10:45	8.44	1320	0.14
USGS	02392975	2009-09-20 11:00	8.76	1410	0.19
USGS	02392975	2009-09-20 11:15	8.76	1410	0.00
USGS	02392975	2009-09-20 11:30	8.69	1390	0.01
USGS	02392975	2009-09-20 11:45	8.82	1430	0.00
USGS	02392975	2009-09-20 12:00	8.89	1450	0.01
USGS	02392975	2009-09-20 12:15	8.85	1440	0.03
USGS	02392975	2009-09-20 12:30	8.95	1470	0.01
USGS	02392975	2009-09-20 12:45	8.96	1470	0.00
USGS	02392975	2009-09-20 13:00	9.03	1490	0.03
USGS	02392975	2009-09-20 13:15	9.08	1510	0.00
USGS	02392975	2009-09-20 13:30	9.02	1490	0.01
USGS	02392975	2009-09-20 13:45	9.10	1510	0.03
USGS	02392975	2009-09-20 14:00	9.04	1500	0.01
USGS	02392975	2009-09-20 14:15	9.14	1530	0.00
USGS	02392975	2009-09-20 14:30	9.31	1580	0.00
USGS	02392975	2009-09-20 14:45	9.18	1540	0.04
USGS	02392975	2009-09-20 15:00	9.26	1560	0.00
USGS	02392975	2009-09-20 15:15	9.29	1570	0.00
USGS	02392975	2009-09-20 15:30	9.26	1560	0.02
USGS	02392975	2009-09-20 15:45	9.34	1590	0.00
USGS	02392975	2009-09-20 16:00	9.29	1570	0.00
USGS	02392975	2009-09-20 16:15	9.35	1590	0.00
USGS	02392975	2009-09-20 16:30	9.33	1580	0.00
USGS	02392975	2009-09-20 16:45	9.27	1570	0.00
USGS	02392975	2009-09-20 17:00	9.30	1580	0.00
USGS	02392975	2009-09-20 17:15	9.31	1580	0.00
USGS	02392975	2009-09-20 17:30	9.27	1570	0.00
USGS	02392975	2009-09-20 17:45	9.15	1530	0.00
USGS	02392975	2009-09-20 18:00	9.10	1510	0.00
USGS	02392975	2009-09-20 18:15	9.02	1490	0.00
USGS	02392975	2009-09-20 18:30	8.96	1470	0.00
USGS	02392975	2009-09-20 18:45	8.82	1430	0.01
USGS	02392975	2009-09-20 19:00	8.90	1450	0.00
USGS	02392975	2009-09-20 19:15	8.67	1380	0.00
USGS	02392975	2009-09-20 19:30	8.45	1320	0.01
USGS	02392975	2009-09-20 19:45	8.27	1270	0.00
USGS	02392975	2009-09-20 20:00	8.00	1190	0.01
USGS	02392975	2009-09-20 20:15	7.78	1130	0.00
USGS	02392975	2009-09-20 20:30	7.52	1060	0.00
USGS	02392975	2009-09-20 20:45	7.29	1000	0.01
USGS	02392975	2009-09-20 21:00	6.99	925	0.00
USGS	02392975	2009-09-20 21:15	6.76	865	0.03
USGS	02392975	2009-09-20 21:30	6.58	819	0.01
USGS	02392975	2009-09-20 21:45	6.48	794	0.01
USGS	02392975	2009-09-20 22:00	6.25	738	0.05
USGS	02392975	2009-09-20 22:15	6.09	701	0.04
USGS	02392975	2009-09-20 22:30	6.08	699	0.04
USGS	02392975	2009-09-20 22:45	6.05	692	0.04
USGS	02392975	2009-09-20 23:00	5.94	667	0.03
USGS	02392975	2009-09-20 23:15	5.90	657	0.05
USGS	02392975	2009-09-20 23:30	5.94	667	0.04
USGS	02392975	2009-09-20 23:45	6.09	701	0.44
USGS	02392975	2009-09-21 00:00	6.41	777	0.24
USGS	02392975	2009-09-21 00:15	6.97	920	0.24
USGS	02392975	2009-09-21 00:30	6.97	920	0.00
USGS	02392975	2009-09-21 00:45	8.06	1210	0.13
USGS	02392975	2009-09-21 01:00	8.45	1320	0.11
USGS	02392975	2009-09-21 01:15	8.70	1390	0.07
USGS	02392975	2009-09-21 01:30	8.70	1390	0.00

USGS	02392975	2009-09-21 01:45	9.14	1530	0.07
USGS	02392975	2009-09-21 02:00	9.14	1530	0.00
USGS	02392975	2009-09-21 02:15	9.29	1570	0.02
USGS	02392975	2009-09-21 02:30	9.45	1620	0.03
USGS	02392975	2009-09-21 02:45	9.59	1670	0.04
USGS	02392975	2009-09-21 03:00	9.87	1770	0.10
USGS	02392975	2009-09-21 03:15	9.87	1770	0.00
USGS	02392975	2009-09-21 03:30	9.91	1780	0.01
USGS	02392975	2009-09-21 03:45	10.22	1900	0.03
USGS	02392975	2009-09-21 04:00	10.21	1900	0.00
USGS	02392975	2009-09-21 04:15	10.20	1890	0.00
USGS	02392975	2009-09-21 04:30	10.20	1890	0.00
USGS	02392975	2009-09-21 04:45	10.36	1950	0.00
USGS	02392975	2009-09-21 05:00	10.34	1950	0.00
USGS	02392975	2009-09-21 05:15	10.34	1950	0.00
USGS	02392975	2009-09-21 05:30	10.34	1950	0.00
USGS	02392975	2009-09-21 05:45	10.46	1990	0.01
USGS	02392975	2009-09-21 06:00	10.39	1970	0.04
USGS	02392975	2009-09-21 06:15	10.37	1960	0.06
USGS	02392975	2009-09-21 06:30	10.37	1960	0.00
USGS	02392975	2009-09-21 06:45	10.34	1950	0.04
USGS	02392975	2009-09-21 07:00	10.42	1980	0.02
USGS	02392975	2009-09-21 07:15	10.44	1980	0.02
USGS	02392975	2009-09-21 07:30	10.44	1980	0.00
USGS	02392975	2009-09-21 07:45	10.44	1980	0.08
USGS	02392975	2009-09-21 08:00	10.44	1980	0.00
USGS	02392975	2009-09-21 08:15	10.47	2000	0.67
USGS	02392975	2009-09-21 08:30	10.47	2000	0.00
USGS	02392975	2009-09-21 08:45	10.79	2120	0.13
USGS	02392975	2009-09-21 09:00	10.84	2140	0.01
USGS	02392975	2009-09-21 09:15	11.00	2210	0.01
USGS	02392975	2009-09-21 09:30	11.00	2210	0.00
USGS	02392975	2009-09-21 09:45	11.13	2270	0.13
USGS	02392975	2009-09-21 10:00	11.40	2410	0.04
USGS	02392975	2009-09-21 10:15	11.40	2410	0.00
USGS	02392975	2009-09-21 10:30	11.40	2410	0.66
USGS	02392975	2009-09-21 10:45	11.74	2580	0.00
USGS	02392975	2009-09-21 11:00	12.00	2720	
USGS	02392975	2009-09-21 11:15	13.56	3730	
USGS	02392975	2009-09-21 11:30	13.56	3730	
USGS	02392975	2009-09-21 11:45	15.10	5050	5.53
USGS	02392975	2009-09-21 12:00	15.10	5050	0.00
USGS	02392975	2009-09-21 12:15	15.63	5590	0.12
USGS	02392975	2009-09-21 12:30	15.94	5910	0.15
USGS	02392975	2009-09-21 12:45	16.65	6740	0.32
USGS	02392975	2009-09-21 13:00	16.92	7070	0.18
USGS	02392975	2009-09-21 13:15	16.92	7070	0.00
USGS	02392975	2009-09-21 13:30	17.31	7580	0.00
USGS	02392975	2009-09-21 13:45	17.71	8110	0.00
USGS	02392975	2009-09-21 14:00	18.36	9090	0.14
USGS	02392975	2009-09-21 14:15	18.36	9090	0.00
USGS	02392975	2009-09-21 14:30	18.56	9410	0.04
USGS	02392975	2009-09-21 14:45	19.01	10200	0.08
USGS	02392975	2009-09-21 15:00	19.31	10700	0.03
USGS	02392975	2009-09-21 15:15	19.26	10600	0.01
USGS	02392975	2009-09-21 15:30	19.26	10600	0.00
USGS	02392975	2009-09-21 15:45	19.46	11000	0.20
USGS	02392975	2009-09-21 16:00	19.45	11000	0.01
USGS	02392975	2009-09-21 16:15	19.66	11300	0.01
USGS	02392975	2009-09-21 16:30	19.66	11300	0.00
USGS	02392975	2009-09-21 16:45	19.56	11200	0.00
USGS	02392975	2009-09-21 17:00	19.53	11100	0.00
USGS	02392975	2009-09-21 17:15	19.25	10600	0.00
USGS	02392975	2009-09-21 17:30	19.25	10600	0.00

USGS	02392975	2009-09-21 17:45	19.11	10300	0.00
USGS	02392975	2009-09-21 18:00	18.87	9930	0.00
USGS	02392975	2009-09-21 18:15	19.05	10200	0.00
USGS	02392975	2009-09-21 18:30	19.05	10200	0.00
USGS	02392975	2009-09-21 18:45	18.70	9640	0.00
USGS	02392975	2009-09-21 19:00	18.56	9410	0.00
USGS	02392975	2009-09-21 19:15	18.34	9050	0.00
USGS	02392975	2009-09-21 19:30	18.34	9050	0.00
USGS	02392975	2009-09-21 19:45	18.03	8570	0.00
USGS	02392975	2009-09-21 20:00	17.83	8280	0.00
USGS	02392975	2009-09-21 20:15	17.76	8180	0.00
USGS	02392975	2009-09-21 20:30	17.76	8180	0.00
USGS	02392975	2009-09-21 20:45	17.34	7620	0.00
USGS	02392975	2009-09-21 21:00	17.17	7390	0.00
USGS	02392975	2009-09-21 21:15	17.10	7300	0.00
USGS	02392975	2009-09-21 21:30	17.10	7300	0.00
USGS	02392975	2009-09-21 21:45	16.85	6990	0.00
USGS	02392975	2009-09-21 22:00	16.46	6510	0.00
USGS	02392975	2009-09-21 22:15	16.28	6300	0.00
USGS	02392975	2009-09-21 22:30	16.28	6300	0.00
USGS	02392975	2009-09-21 22:45	15.90	5870	0.00
USGS	02392975	2009-09-21 23:00	15.79	5750	0.00
USGS	02392975	2009-09-21 23:15	15.61	5560	0.00
USGS	02392975	2009-09-21 23:30	15.61	5560	0.00
USGS	02392975	2009-09-21 23:45	15.26	5210	0.00
USGS	02392975	2009-09-22 00:00	15.04	4990	0.00
USGS	02392975	2009-09-22 00:15	14.83	4790	0.00
USGS	02392975	2009-09-22 00:30	14.83	4790	0.00
USGS	02392975	2009-09-22 00:45	14.43	4420	0.00
USGS	02392975	2009-09-22 01:00	14.32	4330	0.00
USGS	02392975	2009-09-22 01:15	14.10	4140	0.00
USGS	02392975	2009-09-22 01:30	14.10	4140	0.00
USGS	02392975	2009-09-22 01:45	13.72	3840	0.00
USGS	02392975	2009-09-22 02:00	13.51	3690	0.01
USGS	02392975	2009-09-22 02:15	13.26	3520	0.00
USGS	02392975	2009-09-22 02:30	13.26	3520	0.00
USGS	02392975	2009-09-22 02:45	12.90	3280	0.00
USGS	02392975	2009-09-22 03:00	12.70	3150	0.01
USGS	02392975	2009-09-22 03:15	12.43	2980	0.01
USGS	02392975	2009-09-22 03:30	12.43	2980	0.00
USGS	02392975	2009-09-22 03:45	12.06	2760	0.00
USGS	02392975	2009-09-22 04:00	11.86	2640	0.00
USGS	02392975	2009-09-22 04:15	11.54	2480	0.00
USGS	02392975	2009-09-22 04:30	11.54	2480	0.00
USGS	02392975	2009-09-22 04:45	11.23	2320	0.01
USGS	02392975	2009-09-22 05:00	10.83	2140	0.00
USGS	02392975	2009-09-22 05:15	10.67	2080	0.00
USGS	02392975	2009-09-22 05:30	10.67	2080	0.00
USGS	02392975	2009-09-22 05:45	10.17	1880	0.00
USGS	02392975	2009-09-22 06:00	10.17	1880	0.00
USGS	02392975	2009-09-22 06:15	9.82	1750	0.00
USGS	02392975	2009-09-22 06:30	9.58	1660	0.00
USGS	02392975	2009-09-22 06:45	9.25	1560	0.00
USGS	02392975	2009-09-22 07:00	8.92	1460	0.00
USGS	02392975	2009-09-22 07:15	8.60	1360	0.00
USGS	02392975	2009-09-22 07:30	8.25	1260	0.00
USGS	02392975	2009-09-22 07:45	7.97	1180	0.00
USGS	02392975	2009-09-22 08:00	7.61	1090	0.00
USGS	02392975	2009-09-22 08:15	7.39	1030	0.00
USGS	02392975	2009-09-22 08:30	7.18	973	0.00
USGS	02392975	2009-09-22 08:45	6.91	904	0.00
USGS	02392975	2009-09-22 09:00	6.73	857	0.00
USGS	02392975	2009-09-22 09:15	6.55	812	0.00
USGS	02392975	2009-09-22 09:30	6.38	770	0.00

USGS	02392975	2009-09-22 09:45	6.26	741	0.00
USGS	02392975	2009-09-22 10:00	6.10	703	0.00
USGS	02392975	2009-09-22 10:15	5.99	678	0.00
USGS	02392975	2009-09-22 10:30	5.86	649	0.00
USGS	02392975	2009-09-22 10:45	5.80	635	0.00
USGS	02392975	2009-09-22 11:00	5.70	613	0.00
USGS	02392975	2009-09-22 11:15	5.64	600	0.00
USGS	02392975	2009-09-22 11:30	5.56	583	0.00
USGS	02392975	2009-09-22 11:45	5.47	564	0.00
USGS	02392975	2009-09-22 12:00	5.41	552	0.00
USGS	02392975	2009-09-22 12:15	5.33	535	0.00
USGS	02392975	2009-09-22 12:30	5.28	525	0.00
USGS	02392975	2009-09-22 12:45	5.20	509	0.00
USGS	02392975	2009-09-22 13:00	5.18	505	0.00
USGS	02392975	2009-09-22 13:15	5.10	489	0.00
USGS	02392975	2009-09-22 13:30	5.07	483	0.00
USGS	02392975	2009-09-22 13:45	5.04	477	0.00
USGS	02392975	2009-09-22 14:00	5.00	469	0.00
USGS	02392975	2009-09-22 14:15	4.98	465	0.00
USGS	02392975	2009-09-22 14:30	4.99	467	0.00
USGS	02392975	2009-09-22 14:45	4.98	465	0.00
USGS	02392975	2009-09-22 15:00	4.98	465	0.00
USGS	02392975	2009-09-22 15:15	4.95	459	0.00
USGS	02392975	2009-09-22 15:30	4.92	454	0.00
USGS	02392975	2009-09-22 15:45	4.92	454	0.00
USGS	02392975	2009-09-22 16:00	4.85	440	0.00
USGS	02392975	2009-09-22 16:15	4.84	438	0.00
USGS	02392975	2009-09-22 16:30	4.83	437	0.00
USGS	02392975	2009-09-22 16:45	4.77	425	0.00
USGS	02392975	2009-09-22 17:00	4.70	413	0.00
USGS	02392975	2009-09-22 17:15	4.64	402	0.00
USGS	02392975	2009-09-22 17:30	4.62	398	0.00
USGS	02392975	2009-09-22 17:45	4.58	391	0.00
USGS	02392975	2009-09-22 18:00	4.60	395	0.00
USGS	02392975	2009-09-22 18:15	4.56	387	0.00
USGS	02392975	2009-09-22 18:30	4.53	382	0.00
USGS	02392975	2009-09-22 18:45	4.54	384	0.00
USGS	02392975	2009-09-22 19:00	4.51	379	0.00
USGS	02392975	2009-09-22 19:15	4.47	372	0.00
USGS	02392975	2009-09-22 19:30	4.44	366	0.00
USGS	02392975	2009-09-22 19:45	4.43	364	0.00
USGS	02392975	2009-09-22 20:00	4.36	352	0.00
USGS	02392975	2009-09-22 20:15	4.32	345	0.00
USGS	02392975	2009-09-22 20:30	4.27	337	0.00
USGS	02392975	2009-09-22 20:45	4.24	332	0.00
USGS	02392975	2009-09-22 21:00	4.26	335	0.00
USGS	02392975	2009-09-22 21:15	4.25	333	0.00
USGS	02392975	2009-09-22 21:30	4.22	328	0.00
USGS	02392975	2009-09-22 21:45	4.18	322	0.00
USGS	02392975	2009-09-22 22:00	4.11	310	0.00
USGS	02392975	2009-09-22 22:15	4.07	304	0.00
USGS	02392975	2009-09-22 22:30	4.03	297	0.00
USGS	02392975	2009-09-22 22:45	4.03	297	0.00
USGS	02392975	2009-09-22 23:00	4.03	297	0.00
USGS	02392975	2009-09-22 23:15	4.01	294	0.00
USGS	02392975	2009-09-22 23:30	3.97	288	0.00
USGS	02392975	2009-09-22 23:45	3.99	291	0.00
USGS	02392975	2009-09-23 00:00	3.92	280	0.00
USGS	02392975	2009-09-23 00:15	3.96	286	0.00
USGS	02392975	2009-09-23 00:30	3.94	283	0.00
USGS	02392975	2009-09-23 00:45	3.92	280	0.00
USGS	02392975	2009-09-23 01:00	3.92	280	0.00
USGS	02392975	2009-09-23 01:15	3.93	282	0.00
USGS	02392975	2009-09-23 01:30	3.91	279	0.00

USGS	02392975	2009-09-23 01:45	3.90	277	0.00
USGS	02392975	2009-09-23 02:00	3.90	277	0.00
USGS	02392975	2009-09-23 02:15	3.87	272	0.00
USGS	02392975	2009-09-23 02:30	3.84	267	0.00
USGS	02392975	2009-09-23 02:45	3.87	272	0.00
USGS	02392975	2009-09-23 03:00	3.84	267	0.00
USGS	02392975	2009-09-23 03:15	3.86	271	0.00
USGS	02392975	2009-09-23 03:30	3.83	266	0.00
USGS	02392975	2009-09-23 03:45	3.82	264	0.00
USGS	02392975	2009-09-23 04:00	3.83	266	0.00
USGS	02392975	2009-09-23 04:15	3.81	263	0.00
USGS	02392975	2009-09-23 04:30	3.78	258	0.00
USGS	02392975	2009-09-23 04:45	3.78	258	0.00
USGS	02392975	2009-09-23 05:00	3.81	263	0.00
USGS	02392975	2009-09-23 05:15	3.78	258	0.00
USGS	02392975	2009-09-23 05:30	3.77	256	0.00
USGS	02392975	2009-09-23 05:45	3.72	249	0.00
USGS	02392975	2009-09-23 06:00	3.78	258	0.00
USGS	02392975	2009-09-23 06:15	3.77	256	0.00
USGS	02392975	2009-09-23 06:30	3.72	249	0.00
USGS	02392975	2009-09-23 06:45	3.74	252	0.00
USGS	02392975	2009-09-23 07:00	3.75	253	0.00
USGS	02392975	2009-09-23 07:15	3.72	249	0.00
USGS	02392975	2009-09-23 07:30	3.73	250	0.00
USGS	02392975	2009-09-23 07:45	3.74	252	0.00
USGS	02392975	2009-09-23 08:00	3.71	247	0.00
USGS	02392975	2009-09-23 08:15	3.71	247	0.00
USGS	02392975	2009-09-23 08:30	3.70	246	0.00
USGS	02392975	2009-09-23 08:45	3.70	246	0.00
USGS	02392975	2009-09-23 09:00	3.70	246	0.00
USGS	02392975	2009-09-23 09:15	3.70	246	0.00
USGS	02392975	2009-09-23 09:30	3.71	247	0.00
USGS	02392975	2009-09-23 09:45	3.68	243	0.00
USGS	02392975	2009-09-23 10:00	3.68	243	0.00
USGS	02392975	2009-09-23 10:15	3.67	241	0.00
USGS	02392975	2009-09-23 10:30	3.65	238	0.00
USGS	02392975	2009-09-23 10:45	3.67	241	0.00
USGS	02392975	2009-09-23 11:00	3.66	240	0.00
USGS	02392975	2009-09-23 11:15	3.63	235	0.00
USGS	02392975	2009-09-23 11:30	3.65	238	0.00
USGS	02392975	2009-09-23 11:45	3.58	228	0.00
USGS	02392975	2009-09-23 12:00	3.61	232	0.00
USGS	02392975	2009-09-23 12:15	3.60	231	0.00
USGS	02392975	2009-09-23 12:30	3.60	231	0.00
USGS	02392975	2009-09-23 12:45	3.60	231	0.00
USGS	02392975	2009-09-23 13:00	3.58	228	0.00
USGS	02392975	2009-09-23 13:15	3.59	229	0.00
USGS	02392975	2009-09-23 13:30	3.58	228	0.00
USGS	02392975	2009-09-23 13:45	3.55	223	0.00
USGS	02392975	2009-09-23 14:00	3.55	223	0.00
USGS	02392975	2009-09-23 14:15	3.55	223	0.00
USGS	02392975	2009-09-23 14:30	3.55	223	0.00
USGS	02392975	2009-09-23 14:45	3.54	222	0.00
USGS	02392975	2009-09-23 15:00	3.55	223	0.00
USGS	02392975	2009-09-23 15:15	3.56	225	0.00
USGS	02392975	2009-09-23 15:30	3.55	223	0.00
USGS	02392975	2009-09-23 15:45	3.50	216	0.00
USGS	02392975	2009-09-23 16:00	3.53	221	0.00
USGS	02392975	2009-09-23 16:15	3.52	219	0.00
USGS	02392975	2009-09-23 16:30	3.50	216	0.00
USGS	02392975	2009-09-23 16:45	3.49	215	0.00
USGS	02392975	2009-09-23 17:00	3.51	218	0.00
USGS	02392975	2009-09-23 17:15	3.51	218	0.00
USGS	02392975	2009-09-23 17:30	3.47	212	0.00

USGS	02392975	2009-09-23 17:45	3.47	212	0.00
USGS	02392975	2009-09-23 18:00	3.49	215	0.00
USGS	02392975	2009-09-23 18:15	3.48	213	0.00
USGS	02392975	2009-09-23 18:30	3.47	212	0.00
USGS	02392975	2009-09-23 18:45	3.48	213	0.00
USGS	02392975	2009-09-23 19:00	3.46	211	0.00
USGS	02392975	2009-09-23 19:15	3.44	208	0.00
USGS	02392975	2009-09-23 19:30	3.41	204	0.00
USGS	02392975	2009-09-23 19:45	3.44	208	0.00
USGS	02392975	2009-09-23 20:00	3.44	208	0.00
USGS	02392975	2009-09-23 20:15	3.42	205	0.00
USGS	02392975	2009-09-23 20:30	3.43	206	0.00
USGS	02392975	2009-09-23 20:45	3.41	204	0.00
USGS	02392975	2009-09-23 21:00	3.39	201	0.00
USGS	02392975	2009-09-23 21:15	3.40	202	0.00
USGS	02392975	2009-09-23 21:30	3.39	201	0.00
USGS	02392975	2009-09-23 21:45	3.40	202	0.00
USGS	02392975	2009-09-23 22:00	3.40	202	0.00
USGS	02392975	2009-09-23 22:15	3.39	201	0.00
USGS	02392975	2009-09-23 22:30	3.37	198	0.00
USGS	02392975	2009-09-23 22:45	3.38	200	0.00
USGS	02392975	2009-09-23 23:00	3.37	198	0.00
USGS	02392975	2009-09-23 23:15	3.37	198	0.00
USGS	02392975	2009-09-23 23:30	3.36	197	0.00
USGS	02392975	2009-09-23 23:45	3.38	200	0.00
USGS	02392975	2009-09-24 00:00	3.39	201	0.00
USGS	02392975	2009-09-24 00:15	3.36	197	0.00
USGS	02392975	2009-09-24 00:30	3.36	197	0.00
USGS	02392975	2009-09-24 00:45	3.36	197	0.00
USGS	02392975	2009-09-24 01:00	3.35	196	0.00
USGS	02392975	2009-09-24 01:15	3.35	196	0.00
USGS	02392975	2009-09-24 01:30	3.34	194	0.00
USGS	02392975	2009-09-24 01:45	3.35	196	0.00
USGS	02392975	2009-09-24 02:00	3.34	194	0.00
USGS	02392975	2009-09-24 02:15	3.34	194	0.00
USGS	02392975	2009-09-24 02:30	3.34	194	0.00
USGS	02392975	2009-09-24 02:45	3.34	194	0.00
USGS	02392975	2009-09-24 03:00	3.33	193	0.00
USGS	02392975	2009-09-24 03:15	3.34	194	0.00
USGS	02392975	2009-09-24 03:30	3.31	190	0.00
USGS	02392975	2009-09-24 03:45	3.35	196	0.00
USGS	02392975	2009-09-24 04:00	3.32	192	0.00
USGS	02392975	2009-09-24 04:15	3.32	192	0.00
USGS	02392975	2009-09-24 04:30	3.31	190	0.00
USGS	02392975	2009-09-24 04:45	3.31	190	0.00
USGS	02392975	2009-09-24 05:00	3.32	192	0.00
USGS	02392975	2009-09-24 05:15	3.31	190	0.00
USGS	02392975	2009-09-24 05:30	3.29	187	0.00
USGS	02392975	2009-09-24 05:45	3.25	181	0.00
USGS	02392975	2009-09-24 06:00	3.22	177	0.00
USGS	02392975	2009-09-24 06:15	3.17	170	0.00
USGS	02392975	2009-09-24 06:30	3.15	167	0.00
USGS	02392975	2009-09-24 06:45	3.13	164	0.00
USGS	02392975	2009-09-24 07:00	3.11	161	0.00
USGS	02392975	2009-09-24 07:15	3.10	160	0.00
USGS	02392975	2009-09-24 07:30	3.09	159	0.00
USGS	02392975	2009-09-24 07:45	3.07	156	0.00
USGS	02392975	2009-09-24 08:00	3.06	155	0.00
USGS	02392975	2009-09-24 08:15	3.04	152	0.00
USGS	02392975	2009-09-24 08:30	3.04	152	0.00
USGS	02392975	2009-09-24 08:45	3.03	151	0.00
USGS	02392975	2009-09-24 09:00	3.02	149	0.00
USGS	02392975	2009-09-24 09:15	3.01	148	0.00
USGS	02392975	2009-09-24 09:30	3.01	148	0.00

USGS	02392975	2009-09-24 09:45	3.00	147	0.00
USGS	02392975	2009-09-24 10:00	3.00	147	0.00
USGS	02392975	2009-09-24 10:15	2.98	144	0.00
USGS	02392975	2009-09-24 10:30	2.97	143	0.00
USGS	02392975	2009-09-24 10:45	2.97	143	0.00
USGS	02392975	2009-09-24 11:00	2.96	141	0.00
USGS	02392975	2009-09-24 11:15	2.95	140	0.00
USGS	02392975	2009-09-24 11:30	2.96	141	0.00
USGS	02392975	2009-09-24 11:45	2.94	139	0.00
USGS	02392975	2009-09-24 12:00	2.94	139	0.00
USGS	02392975	2009-09-24 12:15	2.93	138	0.00
USGS	02392975	2009-09-24 12:30	2.93	138	0.00
USGS	02392975	2009-09-24 12:45	2.93	138	0.00
USGS	02392975	2009-09-24 13:00	2.92	136	0.00
USGS	02392975	2009-09-24 13:15	2.92	136	0.00
USGS	02392975	2009-09-24 13:30	2.92	136	0.00
USGS	02392975	2009-09-24 13:45	2.91	135	0.00
USGS	02392975	2009-09-24 14:00	2.91	135	0.00
USGS	02392975	2009-09-24 14:15	2.91	135	0.00
USGS	02392975	2009-09-24 14:30	2.90	134	0.00
USGS	02392975	2009-09-24 14:45	2.90	134	0.00
USGS	02392975	2009-09-24 15:00	2.90	134	0.00
USGS	02392975	2009-09-24 15:15	2.89	133	0.00
USGS	02392975	2009-09-24 15:30	2.89	133	0.00
USGS	02392975	2009-09-24 15:45	2.89	133	0.00
USGS	02392975	2009-09-24 16:00	2.89	133	0.00
USGS	02392975	2009-09-24 16:15	2.88	132	0.00
USGS	02392975	2009-09-24 16:30	2.88	132	0.00
USGS	02392975	2009-09-24 16:45	2.89	133	0.00
USGS	02392975	2009-09-24 17:00	2.89	133	0.00
USGS	02392975	2009-09-24 17:15	2.88	132	0.00
USGS	02392975	2009-09-24 17:30	2.89	133	0.00
USGS	02392975	2009-09-24 17:45	2.88	132	0.00
USGS	02392975	2009-09-24 18:00	2.88	132	0.00
USGS	02392975	2009-09-24 18:15	2.87	130	0.00
USGS	02392975	2009-09-24 18:30	2.87	130	0.00
USGS	02392975	2009-09-24 18:45	2.87	130	0.00
USGS	02392975	2009-09-24 19:00	2.86	129	0.00
USGS	02392975	2009-09-24 19:15	2.86	129	0.00
USGS	02392975	2009-09-24 19:30	2.86	129	0.00
USGS	02392975	2009-09-24 19:45	2.85	128	0.00
USGS	02392975	2009-09-24 20:00	2.85	128	0.00
USGS	02392975	2009-09-24 20:15	2.85	128	0.00
USGS	02392975	2009-09-24 20:30	2.84	127	0.00
USGS	02392975	2009-09-24 20:45	2.84	127	0.00
USGS	02392975	2009-09-24 21:00	2.84	127	0.00
USGS	02392975	2009-09-24 21:15	2.84	127	0.00
USGS	02392975	2009-09-24 21:30	2.83	126	0.00
USGS	02392975	2009-09-24 21:45	2.83	126	0.00
USGS	02392975	2009-09-24 22:00	2.82	124	0.00
USGS	02392975	2009-09-24 22:15	2.82	124	0.00
USGS	02392975	2009-09-24 22:30	2.82	124	0.00
USGS	02392975	2009-09-24 22:45	2.81	123	0.00
USGS	02392975	2009-09-24 23:00	2.82	124	0.00
USGS	02392975	2009-09-24 23:15	2.82	124	0.00
USGS	02392975	2009-09-24 23:30	2.82	124	0.00
USGS	02392975	2009-09-24 23:45	2.81	123	0.00
USGS	02392975	2009-09-25 00:00	2.81	123	0.00
USGS	02392975	2009-09-25 00:15	2.81	123	0.00
USGS	02392975	2009-09-25 00:30	2.81	123	0.00
USGS	02392975	2009-09-25 00:45	2.81	123	0.00
USGS	02392975	2009-09-25 01:00	2.80	122	0.00
USGS	02392975	2009-09-25 01:15	2.81	123	0.00
USGS	02392975	2009-09-25 01:30	2.80	122	0.00

USGS	02392975	2009-09-25 01:45	2.80	122	0.00
USGS	02392975	2009-09-25 02:00	2.80	122	0.00
USGS	02392975	2009-09-25 02:15	2.79	121	0.00
USGS	02392975	2009-09-25 02:30	2.80	122	0.00
USGS	02392975	2009-09-25 02:45	2.79	121	0.00
USGS	02392975	2009-09-25 03:00	2.79	121	0.00
USGS	02392975	2009-09-25 03:15	2.79	121	0.00
USGS	02392975	2009-09-25 03:30	2.79	121	0.00
USGS	02392975	2009-09-25 03:45	2.78	119	0.00
USGS	02392975	2009-09-25 04:00	2.79	121	0.00
USGS	02392975	2009-09-25 04:15	2.78	119	0.00
USGS	02392975	2009-09-25 04:30	2.78	119	0.00
USGS	02392975	2009-09-25 04:45	2.77	118	0.00
USGS	02392975	2009-09-25 05:00	2.77	118	0.00
USGS	02392975	2009-09-25 05:15	2.77	118	0.00
USGS	02392975	2009-09-25 05:30	2.76	117	0.00
USGS	02392975	2009-09-25 05:45	2.76	117	0.00
USGS	02392975	2009-09-25 06:00	2.75	115	0.00
USGS	02392975	2009-09-25 06:15	2.73	113	0.00
USGS	02392975	2009-09-25 06:30	2.72	111	0.00

Expansion and Contraction Reach Length Computation

I-75 over Noonday Creek

Expansion Reach Length Computation

b - bridge opening width	170
B - floodplain width	500
b/B	0.34
(B-b)/2 avg. obs. Length	165
n(ob)	0.12
n(mc)	0.06
n(ob)/n(mc)	2.18
S (ft/ft)	0.0029
S (ft/mile)	15.05

Ranges of Expansion Ratios

		n(ob)/n(mc)=1	n(ob)/n(mc)=2	n(ob)/n(mc)=4
b/B=0.10 S=1 ft/mile	5 ft/mile	1.4-3.6	1.3-3.0	1.2-2.1
	10 ft/mile	1.0-2.5	0.8-2.0	0.8-2.0
		1.0-2.2	0.8-2.0	0.8-2.0
b/B=0.25 S=1 ft/mile	5 ft/mile	1.6-3.0	1.4-2.5	1.2-2.0
	10 ft/mile	1.5-2.5	1.3-2.0	1.3-2.0
		1.5-2.0	1.3-2.0	1.3-2.0
b/B=0.50 S=1 ft/mile	5 ft/mile	1.4-2.6	1.3-1.9	1.2-1.4
	10 ft/mile	1.3-2.1	1.2-1.6	1.0-1.4
		1.3-2.0	1.2-1.5	1.0-1.4

Er-Exp. rate from chart	1.3	2.0
Exp. Reach Length	214.5	330

Contraction Reach Length Computation

Cr-Contr. rate from chart	0.8	1.4
Contr. Reach Length	132	231

Ranges of Contraction Ratios

	n(ob)/n(mc)=1	n(ob)/n(mc)=2	n(ob)/n(mc)=4
S=1 ft/mile	1.0-2.3	0.8-1.7	0.7-1.3
	5 ft/mile	1.0-1.9	0.8-1.5
	10 ft/mile	1.0-1.9	0.8-1.4

Reference : Hydrologic Engineering Center (HEC) Research Document No. 42 **Flow Transitions in Bridge Backwater Analysis**, John H. Hunt and Gary Brunner, dated September 1995.

Section IV
Hydraulic Engineering Field Data

HYDRAULIC ENGINEERING FIELD REPORT

I. Hydraulic and Hydrologic Data Required for all Bridge Stream Crossing Projects. See Appendix A of the Georgia DOT Drainage Manual for required survey information.

A. Project Location

Location Description:	I-75 over Noonday Creek	Date:	08-27-2009
Reported by:	HMM Personnel	HMObject No.:	255717
Client:	PBS&J	Project No.:	NH000-0073-03(242)
County:	Cobb	GDOT District:	7
Stream Name:	Noonday Creek	Route:	I-75

B. Site Location

Floodplain Description:

- a) Flat, rolling, mountainous etc.: **Rolling**
- b) Wooded, heavily vegetated, pasture, swampy etc.: **Vegetated**

Stream Channel Description:

- a) Banks stable, unstable etc.: **Well-defined; some instability at banks upstream and downstream**
- b) Stream meandering, straight etc.: **Meandering, particularly downstream of NB bridge**
- c) Debris: **No debris witnessed**
- d) Is there any fill in the upstream or downstream floodplains that will affect the natural drainage or limit floodplain width at this site? **Yes. Development exists upstream and downstream.**

C. Required Existing Bridge Data at Project Site

Bridge ID #:	067-0083-0
Date Built:	1975
Skew angle of bridge or bents :	90°

Substructure Description:

- a) column type (concrete, steel, pile, etc.): **Concrete**
- b) size of column: **3'x3'**
- c) number of columns per bent: **3**
- d) height of curb, parapet or barrier:
spurdike length: **2.67'**
spurdike elevation: **n/a**
spurdike location: **n/a**
- e) scour problems at intermediate bents: **None observed**
- f) scour problems at abutments: **None observed**

D. Normal Water Surface Data

- a) Water Surface elevation 500 ft upstream of the survey centerline: **Not Obtained**
- b) Water Surface elevation at the roadway centerline: **Not Obtained**
- c) Water Surface elevation 500 ft downstream of the survey centerline: **Not Obtained**
- d) Is site affected by tides: **No**
- e) Normal high tide: **N/A** Normal low tide: **N/A**

E. Historical Flood Data

- a) Extreme high-water elevation at Site: **938.8** Date: **N/A**
- b) Highest tide elevation observed at Site: **N/A** Date: **N/A**
- c) Location where taken (upstream, downstream, centerline): **N/A**
- c) Source of high-water information: **Existing bridge plans**
- e) Are there any houses that have been flooded: **No**
- f) House location and floor elevation: **No**
- g) Number of times house has been flooded, elevations and dates of floods: **No**
- h) Additional houses that may be flooded? (with floor elevations within 2 ft of the flood of record): **No**

F. Miscellaneous Information

- a) Are water surface elevations at the site affected by other factors such as high-water from other stream, reservoirs etc.: **No**
- b) Length, width, and elevations of dam and spillway if applicable: **N/A**

Note: if the project site is affected by the above factors, additional floodplain cross sections may be required. The Engineer should be contacted during the survey phase to identify the additional cross sections required.

G. Upstream and Downstream Stream Crossings

The below information is required for all bridges or box culverts within 1 mile upstream and downstream of the project site. Additional survey information is required for all hydraulic structures within 2000 ft of the project site.

Upstream Structure

Distance and direction from proposed structure:	500 ft
Railroad or highway structure:	Highway
Route # if highway bridge:	I-75 Southbound
Length of bridge or culvert size	240' long

Substructure Information:

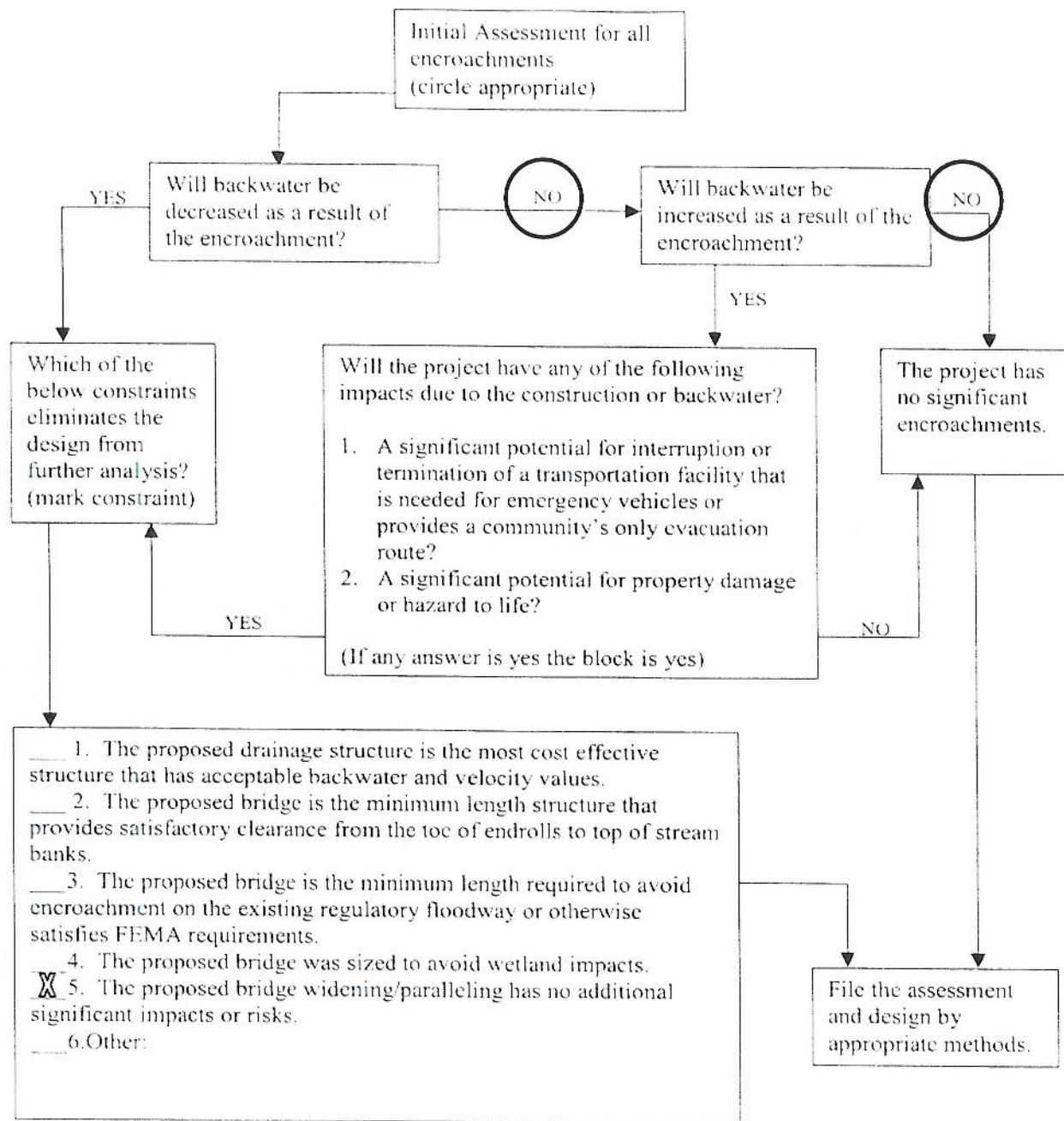
a) column type (concrete, steel, pile):	Concrete
b) column size:	3'x'3
c) number of columns of bent:	3
d) length of over flow bridge or culvert size:	N/A

Downstream Structure

Distance and direction from proposed structure:	1000 ft
Railroad or highway structure:	Highway
Route # if highway bridge:	George Busbee Parkway
Length of bridge or culvert size	220' long

Substructure Information:

a) column type (concrete, steel, pile):	Piles
b) column size:	
c) number of columns of bent:	
d) length of over flow bridge or culvert size:	N/A



Risk Assessment
NH000-0073-03(242) Cobb County
I-75 over Noonday Creek
PI # 714130

BBRIDGE INVENTORY DATA LISTING GEOGRAPHICAL INFORMATION SYSTEMS DEPARTMENT OF TRANSPORTATION

Instrument ID: 067-0083-0

SUFF. RATING 86.30

Location & Geography		Signs & Attachments	
* Structure I.D.No:	067-0083-0	* 104 Highway System:	1
* 200 Bridge Information	06	* 26 Functional Classification:	11
* 6A Feature Int:	NOONDAY CREEK	* 204 Federal Route Type:	1
* 6B Critical Bridge:	0	* 105 Federal Lands Highway:	0
* 7A Route Number Carried:	SR00401	* 110 Truck Route:	1
* 7B Facility Carried:	I-75 (NBL)	206 School Bus Route:	0
* 9 Location:	2.5 MI E OF KENNESAW	217 Benchmark Elevation:	0000.00
2 DOT District:	7	218 Datum:	0
207 Year Photo:	2009	* 19 Bypass Length:	01
* 91 Inspection Frequency:	24	* 20 Toll:	3
92A Fract Crit Insp Freq:	00	* 21 Maintenance:	01
92B Underwater Insp Freq:	00	* 22 Owner:	01
92C Other Spc. Insp Freq:	00	* 31 Design Load:	6
* 4 Place Code:	000000	* 37 Historical Significance:	5
* 5 Inventory Route (O/U):	1	205 Congressional District:	11
Type:	1	27 Year Constructed:	1975
Designation:	1	106 Year Reconstructed:	0000
Number:	00075	33 Bridge Median:	1
Direction:	0	34 Skew:	15
* 16 Latitude:	34-01.2600	35 Structure Flared:	0
* 17 Longitude:	84-34.2010	38 Navigation Control:	0
98 Border Bridge:	000	213 Special Steel Design:	0
99 ID Number:	0000000000000000	267 Type of Paint:	5
* 100 STRAHNET:	1	* 42 Type of Service on:	1
12 Base Highway Network:	1	235 Hazard Boards:	0
13A LRS Inventory Route:	6710401000	237 Utilities Gas:	00
13B Sub Inventory Route:	0	203 Type Bridge:	W
* 101 Parallel Structure:	R	259 Pile Encasement:	O-O-M-O
* 102 Direction of Traffic:	1	* 43 Structure Type Main:	3 02
* 264 Road Inventory Mile Post:	012.62	45 No. Spans Main:	003
* 208 Inspection Area:	09	44 Structure Type Appr:	0 00
Engineer's Initial:	sgm	46 No. Spans Appr.	0000
* Location I.D. No.:	067-00401D-270.25N	226 Bridge Curve Horz:	1
		111 Pier Protection:	0
		107 Deck Structure Type:	1
		108 Wearing Surface Type:	1
		* 248 County Continuity No.:	M 0
			F

BRIDGE INVENTORY DATA LISTING GEO: A DEPARTMENT OF TRANSPORTATION

Structure ID: 067-0083-0

Cobb

SUFF. RATING 86.30

Programming Data

201 Project No.:	I-75-3 (40) 284 CT.5	* 29 ADT:	144160	Year:	2007
202 Plans Available:	4	* 109 % Trucks:	0		
249 Prop. Proj. No.	0000000000000000	* 28 Lanes On:	03	Under:	00
250 Approval Status:	0000	210 No. Tracks On:	00	Under:	00
251 P.I. No.:	0000000	* 48 Max. Span Length:	245		
252 Contract Date:	02/01/1901	* 49 Structure Length:	58.90		
260 Seismic No.:	000000	51 Br. Rwdy. Width:	58.90		
75 Type Work:	00 0	52 Deck Width:	61.30		
94 Bridge Imp. Cost:	\$ 0	* 47 Tot. Horz. Cl:	58.90		
95 Roadway Imp. Cost:	\$ 0	50 Curb/Sdewlk Width:	0.00/0.00		
96 Total Imp. Cost:	\$ 0	32 Approach Rdwy Width:	060		
76 Imp. Length:	000000	* 229 Shoulder Width:			
97 Imp. Year:	0000	Rear Lt:	14.00	Type:	1 Rt:
114 Future ADT:	216240	Year:	2027	Fwd:	10.00
		Rear:	14.00	Type:	1 Rt:
		Fwd:	14.00	Type:	1 Rt:

Measurements

65 Inventory Rating Method:	1
63 Inventory Rating Method:	1
66 Inventory Type:	2
64 Operating Type:	2
231 Calculated Loads	
H-Modified:	21 0
HS-Modified:	30 0
Type 3:	33 0
Type 3s2:	40 0
Timber:	37 0
Piggyback:	40 0
261 H Inventory Rating:	37
262 H Operating Rating:	63
67 Structural Evaluation:	7
58 Deck Condition:	7
59 Superstructure Condition:	8
* 227 Collision Damage:	0
60A Substructure Condition:	7
60B Scour Condition:	8
60C Underwater Condition:	N
71 Waterway Adequacy:	9
61 Channel Protection Cond:	8
68 Deck Geometry:	7
69 UnderClr. Horz/Vert:	N
72 Appr. Alignment:	8
62 Culvert:	
36 Safety Features Br. Rail:	1
Transition:	1
App. G. Rail:	1
App. Rail End:	1
53 Minimum Cl.Over:	99 ' 99 "
Under:	N
* 228 Min. Vertical Cl	
Act. Odm Dir:	99 ' 99 "
Oppo. Dir:	99 ' 99 "
Posted Odm. Dir:	00 ' 00 "
Oppo. Dir:	00 ' 00 "
55 Lateral Undercl. Rt:	N 0.00
56 Lateral Undercl. Lt:	0.00
* 10 Max Min Vert Cl:	99 ' 99 " Dir: 0
39 Nav Vert Cl:	000 Horz: 0000
216 Water Depth:	02.2 Br. Height: 30.8
222 Slope Protection:	1 Fwrd: 0
221 Spur Dikes Rear:	0
219 Fender System:	0
220 Dolphin:	0
223 Culvert Cover:	000
Type:	
No. Barrels:	0
Width:	0.00 Height: 0.00
Length:	0 Apron: 0 Diver: ZZZZ
* 265 U/W Insp. Area:	0
* Location I.D. No.:	067-00401D-270.25N

Hydraulic Data

215 Waterway Data	
Highwater Elev.:	00000.0 Year: 1900
Avg. Streambed Elev.:	00000.0 Freq.: 00
Drainage Area:	00011
Area Of Opening:	000975
113 Scour Critical:	5
216 Water Depth:	02.2 Br. Height: 30.8
222 Slope Protection:	1 Fwrd: 0
221 Spur Dikes Rear:	0
219 Fender System:	0
220 Dolphin:	0
223 Culvert Cover:	000
Type:	
No. Barrels:	0
Width:	0.00 Height: 0.00
Length:	0 Apron: 0 Diver: ZZZZ
* 265 U/W Insp. Area:	0
* Location I.D. No.:	067-00401D-270.25N
65 Inventory Rating Method:	1
63 Inventory Rating Method:	1
66 Inventory Type:	2
64 Operating Type:	2
231 Calculated Loads	
H-Modified:	21 0
HS-Modified:	30 0
Type 3:	33 0
Type 3s2:	40 0
Timber:	37 0
Piggyback:	40 0
261 H Inventory Rating:	37
262 H Operating Rating:	63
67 Structural Evaluation:	7
58 Deck Condition:	7
59 Superstructure Condition:	8
* 227 Collision Damage:	0
60A Substructure Condition:	7
60B Scour Condition:	8
60C Underwater Condition:	N
71 Waterway Adequacy:	9
61 Channel Protection Cond:	8
68 Deck Geometry:	7
69 UnderClr. Horz/Vert:	N
72 Appr. Alignment:	8
62 Culvert:	
36 Safety Features Br. Rail:	1
Transition:	1
App. G. Rail:	1
App. Rail End:	1
53 Minimum Cl.Over:	99 ' 99 "
Under:	N
* 228 Min. Vertical Cl	
Act. Odm Dir:	99 ' 99 "
Oppo. Dir:	99 ' 99 "
Posted Odm. Dir:	00 ' 00 "
Oppo. Dir:	00 ' 00 "
55 Lateral Undercl. Rt:	N 0.00
56 Lateral Undercl. Lt:	0.00
* 10 Max Min Vert Cl:	99 ' 99 " Dir: 0
39 Nav Vert Cl:	000 Horz: 0000
216 Nav Vert Cl Closed:	000
245 Deck Thickness Main:	7.00
Deck Thick Approach:	0.00
246 Overlay Thickness:	0.00
212 Year Last Painted:	Sup: 1994 Sub: 0000
253 Notification Date	02/01/1901
253 Fed Notify Date:	02/01/1901
* Location I.D. No.:	067-00401D-270.25N

GEORGIA DEPARTMENT - JF TRANSPORTATION

Bridge Component Report

District: 7
 Bridge Inspector: Jerry Cooper
 Location ID: 067-00401D-270.25N
 Structure ID: 067-0083-0

Inspection Area: 09

Inspection Date: 4/8/2009
 Over: NOONDAY CREEK
 County: Cobb
 Road Name: I-75 (NBL)

SubStructure Data

Bent#	Type	Foundation	Col	#Cols	Piling	#Piles	Sway	CAP	Remarks
1	A	DP		0		0		C	CAP ON STEEL PILE
2	B	SF	C	3		0		C	
3	B	SF	C	3		0		C	
4	A	DP		0		0		C	CAP ON STEEL PILE

SuperStructure Data

Span#	Beam Type	Spacing	Length	#Beams	Remarks
1	Steel Beams	8.50	81.50	8	W36 X 194
2	Steel Beams	8.50	82.00	8	W36 X 194
3	Steel Beams	8.50	81.50	8	W36 X 194

Bearing Data

Span#	Rear Type Bearing	FWD Type Bearing	Remarks
1	02 - Fixed Plate	01 - Sliding Plate	GOOD
2	02 - Fixed Plate	01 - Sliding Plate	GOOD
3	01 - Sliding Plate	02 - Fixed Plate	GOOD

GEORGIA DEPARTMENT OF TRANSPORTATION

Deficiency Report

District: 7
Bridge Inspector: Jerry Cooper
Location ID: 067-00401D-270.25N
Structure ID: 067-0083-0

Inspection Date: 4/8/2009
Over: NOONDAY CREEK
County: Cobb
Asst. District Engineer: Shun Pringle

Inspection Area: 09

EVALUATION & DEFICIENCIES

I-75 (NBL) Over NOONDAY CREEK-----2.5 MI E OF KENNESAW

Item	Units	Work	P	Date Reported	Location	Date Completed	Complete
800	LIN. FT.	240	B	5/29/2001		12/14/2001	199.00
845	HOURS	20	B	3/15/2005			***
845	HOURS	56	B	3/21/2007		7/10/2007	111.00

Comments:

GEORGIA DEPARTMENT OF TRANSPORTATION

Bridge Inspection Report

District: 7
Bridge Inspector: Jerry Cooper
Location ID: 067-00401D-270.25N
Structure ID: 067-0083-0

Inspection Date: 4/8/2009
Over: NOONDAY CREEK
County: Cobb
Road Name: I-75 (NBL)

Inspection Area: 09
Bridge Status: 06

EVALUATION & DEFICIENCIES

SubStructure:

Year Painted: 0000

Concrete Caps At Both Abutments, Founded On Steel H-Piles.
 Minor cracking in both abutment caps.
 Minor settlement at both abutments.
 1 pile exposed at abutment 1 less than 1'.
 Bent 2 And 3 Have Concrete Caps On 3 Concrete Columns, Founded On Spread Footings.
 Very minor spalls on column 3 at bent 2.
 Minor cracking bent 3, right side.
 Bent #3 = H-37 Calculated 2004 by Central Office (Load Factor)

SuperStructure:

Year Painted: 1994

3 Span Steel Beam, (8 W36 X 194 Beams Per Span).
 Square End Cover Plates, (Welded).
 Minor section loss on various bearings, but all have been cleaned and painted.
 Span #2 = H-44 Calculated 2004 by Central Office (Load Factor).

Deck:

7.0" Concrete Slab.
 Minor transverse cracking on the top with some very minor cracking on the bottom.
 The joint in the parapet at bents 2 and 3 are jammed.
 Appears that the joint in the handrail was constructed smaller then the deck joint.
 (This condition caused the spall noted below).
 Minor spall in the left outside handrail parapet at bent 3.
 Inside at bent 2 crack spall.
 Minor settlement of both approach slabs, overlaid with asphalt.
 Deck: H-32 Calculated 2004 by Central Office (Load Factor).

General:

Built in 1975 Project # I-75-3 (40) 284CT. 5
 This structure is in Good Condition with some minor cracking and spalls.
 Hand tools and ladder used.
 Calculations for this structure were determined by the Central Office. - February, 2004.

Condition Rating

Temp Shored: No

Component	Material	Rating
Substructure	Concrete	7
Superstructure	Steel	8
Deck	Concrete	7

Truck Type	Gross/H-Mod	HSMod	Tand	3-S-2	Log	Piggy
Calculated Posting	21	30	33	40	37	40
Posting Required	No	No	No	No	No	No
Existing Posting	00	00	00	00	00	00

Not a School Bus Route.

Structure Does Not Require Posting

GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 7
Bridge Inspector: Jerry Cooper
Location ID: 067-00401D-270.25N
Structure ID: 067-0083-0

Inspection Area: 09

Skew: 15

Over: NOONDAY CREEK
County: Cobb
Road Name: I-75 (NBL)

Span #:	1	2	3
Length:	81.5	82.0	81.5

Upstream -

Upstream +		1	2	3	4
08/18/1997	BDH DEM	23.80	26.00	6.10	
04/20/1999	DEM	23.80	26.00	6.10	
08/05/2003	JMC-WBR	24.00	26.00	6.00	
03/15/2005	JMC-WBR	24.10	25.90	6.00	
03/21/2007	JMC-WBR	24.40	26.20	6.00	
04/08/2009	JMC-WBR	24.20	26.10	6.00	

Downstream -

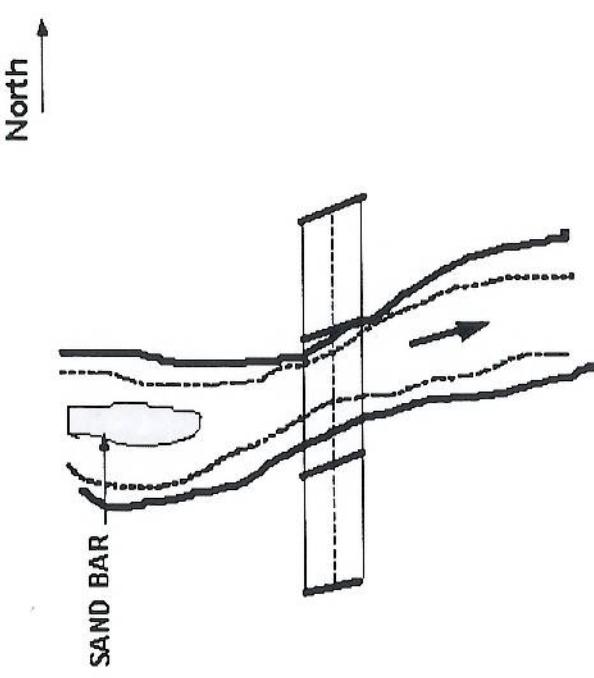
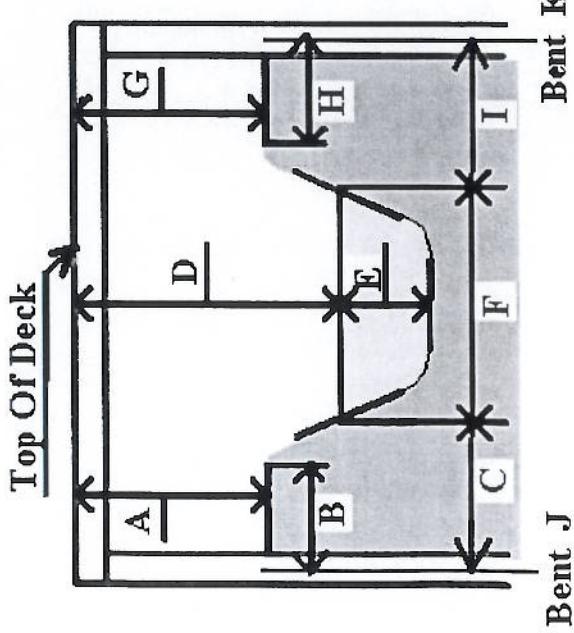
Downstream +		1	2	3	4
08/18/1997	BDH DEM	25.40	26.70	6.40	
04/20/1999	DEM	25.40	26.70	6.40	
08/05/2003	JMC-WBR	25.50	26.80	6.50	
03/15/2005	JMC-WBR	25.70	26.60	6.60	
03/21/2007	JMC-WBR	26.20	26.50	6.60	
04/08/2009	JMC-WBR	26.40	26.20	6.60	

GEORGIA DEPARTMENT OF TRANSPORTATION

Waterway Report

District: 7
 Bridge Inspector: Jerry Cooper
 Location ID: 067-00401D-270.25N
 Structure ID: 067-0083-0

Inspection Area: 09
 Inspection Date: 4/8/2009
 Over: NOONDAY CREEK
 County: Cobb
 Road Name: I-75 (NBL)



Side view at the Channel.

B, C, H, & I are measured to center of bent or B.F.P.R.

Location of Bridge Height	+ 28' from bent #2
Scour Condition:	8

Waterway Adequacy: 9 Channel Protection: 8

Comments:
 Bridge is super elevated downstream side is the high side.

Section V
HEC-RAS Computer Model Output

HEC-RAS FULL VALLEY MODEL

HEC-RAS Plan: Full V River: Noonday Creek Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	-630	2 Yr	2608.00	925.00	935.43	930.66	935.80	0.002855	5.26	741.11	164.93	0.30
1	-630	50 Yr	6003.00	925.00	939.73	934.81	940.25	0.002852	6.77	1517.70	196.12	0.32
1	-630	100 Yr	6889.00	925.00	940.63	935.40	941.18	0.002852	7.07	1695.83	202.60	0.33
1	-630	500 Yr	8519.00	925.00	942.46	936.30	943.10	0.002850	7.65	2135.43	285.68	0.33
1	0	2 Yr	2608.00	925.40	937.06		937.35	0.002132	4.80	1040.62	331.31	0.28
1	0	50 Yr	6003.00	925.40	941.30		941.54	0.001519	5.19	2570.19	415.92	0.25
1	0	100 Yr	6889.00	925.40	942.19		942.43	0.001440	5.27	2957.23	451.38	0.24
1	0	500 Yr	8519.00	925.40	944.02		944.23	0.001188	5.18	3847.52	523.91	0.23
1	245	2 Yr	2608.00	926.70	937.59		937.87	0.002104	4.76	966.23	237.03	0.27
1	245	50 Yr	6003.00	926.70	941.65		942.01	0.002074	6.00	2166.29	390.20	0.29
1	245	100 Yr	6889.00	926.70	942.52		942.88	0.002002	6.15	2529.49	434.66	0.29
1	245	500 Yr	8519.00	926.70	944.29		944.61	0.001675	6.08	3346.32	490.92	0.27
1	395	2 Yr	2608.00	927.00	937.33		938.93	0.016526	10.20	286.59	55.46	0.70
1	395	50 Yr	6003.00	927.00	940.27		943.62	0.024397	15.09	484.86	94.89	0.90
1	395	100 Yr	6889.00	927.00	941.02		944.57	0.023518	15.65	561.05	107.30	0.89
1	395	500 Yr	8519.00	927.00	942.69		946.11	0.019073	15.70	763.34	134.82	0.83
1	590	2 Yr	2608.00	927.20	940.05		940.66	0.005006	6.61	546.94	152.56	0.40
1	590	50 Yr	6003.00	927.20	944.71		945.40	0.003774	7.72	1349.42	191.26	0.38
1	590	100 Yr	6889.00	927.20	945.61		946.33	0.003717	8.02	1525.66	200.45	0.38
1	590	500 Yr	8519.00	927.20	946.99		947.78	0.003786	8.61	1811.02	215.66	0.39
1	790	2 Yr	2608.00	928.10	940.99		941.35	0.002314	5.28	808.89	160.41	0.29
1	790	50 Yr	6003.00	928.10	945.51		946.02	0.002466	6.92	1618.62	199.30	0.32
1	790	100 Yr	6889.00	928.10	946.41		946.96	0.002521	7.28	1801.75	209.24	0.32
1	790	500 Yr	8519.00	928.10	947.81		948.43	0.002664	7.91	2105.14	224.75	0.34
1	1250	2 Yr	2608.00	929.50	941.97		942.24	0.001662	4.61	888.77	161.54	0.25
1	1250	50 Yr	6003.00	929.50	946.57		947.00	0.001905	6.24	1755.93	214.97	0.28
1	1250	100 Yr	6889.00	929.50	947.49		947.96	0.001948	6.56	1959.80	226.52	0.29
1	1250	500 Yr	8519.00	929.50	948.96		949.48	0.002046	7.12	2305.18	244.90	0.30

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

X	X	XXXXXX	XXXX	XXXX	XX	XXXX
X	X	X	X X	X X	X X	X
X	X	X	X	X X	X X	X
XXXXXXX	XXXX	X	XXX	XXXX	XXXXXX	XXXX
X	X	X	X	X X	X X	X
X	X	X	X X	X X	X X	X
X	X	XXXXXX	XXXX	X X	X X	XXXXX

PROJECT DATA

Project Title: I75@Noonday
Project File : I75@Noonday.prj
Run Date and Time: 9/3/2009 2:42:13 PM

Project in English units

PLAN DATA

Plan Title: Full Valley
Plan File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.p01

Geometry Title: Full Valley
Geometry File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.g01

Flow Title : Urban 25%
Flow File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.f01

Plan Summary Information:

Number of: Cross Sections = 7 Multiple Openings = 0
 Culverts = 0 Inline Structures = 0
 Bridges = 0 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Urban 25%
Flow File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.f01

Flow Data (cfs)

River	Reach	RS	2 Yr	5 Yr	10
Yr	25 Yr	50 Yr	100 Yr	500 Yr	
Noonday Creek	1	1250		2608	3814
4266	5375	6003	6889	8519	

Boundary Conditions

River Downstream	Reach	Profile	Upstream
Noonday Creek 1		2 Yr	Normal S = 0.00285
Normal S = 0.00285			Normal S = 0.00285
Noonday Creek 1		5 Yr	Normal S = 0.00285
Normal S = 0.00285			Normal S = 0.00285
Noonday Creek 1		10 Yr	Normal S = 0.00285
Normal S = 0.00285			Normal S = 0.00285
Noonday Creek 1		25 Yr	Normal S = 0.00285
Normal S = 0.00285			Normal S = 0.00285
Noonday Creek 1		50 Yr	Normal S = 0.00285
Normal S = 0.00285			Normal S = 0.00285
Noonday Creek 1		100 Yr	Normal S = 0.00285
Normal S = 0.00285			Normal S = 0.00285
Noonday Creek 1		500 Yr	Normal S = 0.00285
Normal S = 0.00285			

GEOMETRY DATA

Geometry Title: Full Valley

Geometry File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.g01

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 1250

INPUT

Description: Approach

Station Elevation Data		num=	12								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4819	951.6	4864	946.6	4900	942.1	4950	937.3	4980	936.6		
4988	929.5	5000	929.5	5015	930.5	5023	936.8	5045	936.9		
5125	959.5	5160	972.3								

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4819	.13	4980	.06	5023	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4980	5023		400	460	480	

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 790

INPUT

Description: Upstream SBL

Station Elevation Data		num=	13								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4816	955	4851	950	4886	945	4907	940	4924	938		
4978	936.6	4987	930.2	5000	928.1	5012	930.2	5016	935		
5051	938	5096	949	5176	965						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4816	.13	4978	.06	5016	.13

Bank Sta:	Left	Right	Lengths:	Left Channel	Right	Coeff Contr.	Expan.
	4978	5016		200	200	200	

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 590

INPUT

Description: Downstream SBL

Station Elevation Data	num=	13
------------------------	------	----

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4816	955	4851	950	4886	945	4907	940	4924	938
4973	939.8	4993	928.3	5000	927.2	5006	928.4	5016	936
5051	938	5096	949	5176	965				

Manning's n Values			num= 3		
Sta	n	Val	Sta	n	Val
4816	.13	4973	.06	5016	.13

Bank	Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
		4973	5016		140	195	235		.1	.3

CROSS SECTION

RIVER: Noonday Creek
REACH: 1 RS: 395

INPUT

Description: Middle Section - adj elev +0.1

Station		Elevation		Data		num=		8			
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4894	950.1	4953	943.1	4973	939.6	4993	928.1	5000			927
5006	928.2	5016	935.8	5116	945.1						

Manning's n	Values	num=	3					
Sta	n	Val	Sta	n	Val	Sta	n	Val
4894	.	.13	4973	.	.06	5016	.	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4973 5016 95 150 190 .1 .3

CROSS SECTION

RIVER: Noonday Creek
REACH: 1 RS: 245

INPUT

Description: Upstream NBL

Station	Elevation	Data	num=	14								
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	
4529	950	4629	946	4779	940	4849	935	4919	934			
4979	934	4987	926.7	5000	926.7	5014	927.2	5025	933			
5052	938	5092	941	5147	942	5202	950					

Manning's n	Values	num=	3		
Sta	n Val	Sta	n Val	Sta	n Val
4529	.13	4979	.06	5025	.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4979 5025 245 245 245 .1 .3

CROSS SECTION

RIVER: Noonday Creek
REACH: 1 RS: 0

INPUT

Description: Downstream NBL

Manning's n	Values	num=	3					
Sta	n	Val	Sta	n	Val	Sta	n	Val
4701		.13	4986		.06	5032		.13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
4986 5032 600 630 650 .1 .3

CROSS SECTION

RIVER: Noonday Creek
REACH: 1 RS: -630

INPUT

Description: Exit

Station	Elevation	Data	num=	13	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev					
4802	941.9	4867	941.5	4875	941.8	4923	932	4944	932.7	4977	932.7	5000	925	5020	926	5023	932.6
5064	932.4	5092	944.3	5137	945.6												

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val								
4802	.13	4977	.06	5023	.13												

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
4977	5023			0	0	0	.1	.1	.3

SUMMARY OF MANNING'S N VALUES

River: Noonday Creek

Reach	River Sta.	n1	n2	n3
1	1250	.13	.06	.13
1	790	.13	.06	.13
1	590	.13	.06	.13
1	395	.13	.06	.13
1	245	.13	.06	.13
1	0	.13	.06	.13
1	-630	.13	.06	.13

SUMMARY OF REACH LENGTHS

River: Noonday Creek

Reach	River Sta.	Left	Channel	Right
1	1250	400	460	480
1	790	200	200	200
1	590	140	195	235
1	395	95	150	190
1	245	245	245	245
1	0	600	630	650
1	-630	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Noonday Creek

Reach	River Sta.	Contr.	Expan.
1	1250	.1	.3
1	790	.1	.3
1	590	.1	.3
1	395	.1	.3
1	245	.1	.3
1	0	.1	.3
1	-630	.1	.3

HEC-RAS EXISTING BRIDGE MODEL

HEC-RAS Plan: Existing River: Noonday Creek Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	-630	2 Yr	2608.00	925.00	935.43	930.66	935.80	0.002855	5.26	741.11	164.93	0.30
1	-630	5 Yr	3814.00	925.00	937.18	932.05	937.61	0.002854	5.90	1040.91	177.62	0.31
1	-630	10 Yr	4266.00	925.00	937.76	933.40	938.21	0.002853	6.10	1145.01	181.82	0.32
1	-630	25 Yr	5375.00	925.00	939.06	934.38	939.56	0.002850	6.55	1387.44	191.25	0.32
1	-630	50 Yr	6003.00	925.00	939.73	934.81	940.25	0.002852	6.77	1517.70	196.12	0.32
1	-630	100 Yr	6889.00	925.00	940.63	935.40	941.18	0.002852	7.07	1695.83	202.60	0.33
1	-630	500 Yr	8519.00	925.00	942.46	936.30	943.10	0.002850	7.65	2135.43	285.68	0.33
1	0	2 Yr	2608.00	925.40	937.19	932.26	937.39	0.002076	4.78	871.08	332.73	0.27
1	0	5 Yr	3814.00	925.40	938.98	933.89	939.20	0.002069	5.35	1203.26	352.74	0.28
1	0	10 Yr	4266.00	925.40	939.57	934.82	939.80	0.002067	5.53	1318.99	359.35	0.28
1	0	25 Yr	5375.00	925.40	940.91	935.66	941.16	0.002085	5.97	1603.47	400.14	0.29
1	0	50 Yr	6003.00	925.40	941.59	936.09	941.85	0.002064	6.14	1767.39	427.32	0.29
1	0	100 Yr	6889.00	925.40	942.49	936.62	942.77	0.002031	6.35	1984.55	463.27	0.29
1	0	500 Yr	8519.00	925.40	944.33	937.48	944.64	0.001823	6.50	2425.89	536.32	0.28
1	100	Bridge										
1	245	2 Yr	2608.00	926.70	937.65	932.78	937.92	0.002024	4.68	951.79	238.15	0.27
1	245	5 Yr	3814.00	926.70	939.45	935.07	939.75	0.001913	5.12	1348.79	284.76	0.27
1	245	10 Yr	4266.00	926.70	940.05	935.56	940.35	0.001882	5.26	1489.39	301.66	0.27
1	245	25 Yr	5375.00	926.70	941.39	936.37	941.72	0.001838	5.58	1825.76	369.49	0.27
1	245	50 Yr	6003.00	926.70	942.08	936.77	942.41	0.001804	5.72	2020.13	420.54	0.27
1	245	100 Yr	6889.00	926.70	942.99	937.23	943.32	0.001749	5.88	2279.73	449.58	0.27
1	245	500 Yr	8519.00	926.70	944.80	937.93	945.12	0.001550	5.97	2795.07	507.21	0.26
1	395	2 Yr	2608.00	927.00	937.23	935.81	938.89	0.017321	10.37	261.13	54.21	0.72
1	395	5 Yr	3814.00	927.00	938.45	937.67	940.83	0.021297	12.50	336.98	69.53	0.82
1	395	10 Yr	4266.00	927.00	938.81	938.31	941.46	0.022854	13.23	362.81	74.02	0.85
1	395	25 Yr	5375.00	927.00	939.68	939.60	942.89	0.025273	14.66	432.13	85.25	0.90
1	395	50 Yr	6003.00	927.00	940.22	940.22	943.62	0.024936	15.19	480.03	94.05	0.91
1	395	100 Yr	6889.00	927.00	941.02	941.02	944.57	0.023518	15.65	561.05	107.30	0.89
1	395	500 Yr	8519.00	927.00	942.49	942.38	946.10	0.020541	16.10	736.03	131.44	0.86
1	590	2 Yr	2608.00	927.20	940.70	935.99	940.79	0.003609	5.91	649.00	158.01	0.35
1	590	5 Yr	3814.00	927.20	942.94	938.09	942.84	0.002907	6.15	1023.17	176.55	0.32
1	590	10 Yr	4266.00	927.20	943.67	938.81	943.53	0.002751	6.24	1155.01	182.64	0.32
1	590	25 Yr	5375.00	927.20	945.20	940.15	945.05	0.002569	6.53	1443.72	195.87	0.31

HEC-RAS Plan: Existing River: Noonday Creek Reach: 1 (Continued)

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	590	50 Yr	6003.00	927.20	945.86	940.62	945.81	0.002587	6.77	1572.19	203.15	0.32
1	590	100 Yr	6889.00	927.20	946.59	941.24	946.75	0.002723	7.18	1716.71	211.22	0.33
1	590	500 Yr	8519.00	927.20	947.65	942.14	948.24	0.003067	7.97	1931.20	222.98	0.35
1	690	Bridge										
1	790	2 Yr	2608.00	928.10	941.20	935.78	941.53	0.002118	5.12	842.46	162.14	0.28
1	790	5 Yr	3814.00	928.10	943.31	937.95	943.67	0.002014	5.63	1202.95	179.63	0.28
1	790	10 Yr	4266.00	928.10	944.02	938.55	944.39	0.001981	5.79	1331.85	185.48	0.28
1	790	25 Yr	5375.00	928.10	945.51	939.54	945.91	0.001958	6.17	1617.64	199.30	0.28
1	790	50 Yr	6003.00	928.10	946.17	940.07	946.60	0.002006	6.43	1747.18	206.59	0.29
1	790	100 Yr	6889.00	928.10	946.91	940.67	947.39	0.002138	6.84	1895.80	214.83	0.30
1	790	500 Yr	8519.00	928.10	948.01	941.61	948.59	0.002438	7.63	2120.05	227.04	0.32
1	1250	2 Yr	2608.00	929.50	942.11	935.85	942.36	0.001531	4.46	911.71	163.49	0.24
1	1250	5 Yr	3814.00	929.50	944.19	937.84	944.48	0.001520	4.99	1276.82	187.50	0.24
1	1250	10 Yr	4266.00	929.50	944.88	938.35	945.19	0.001509	5.14	1410.14	195.53	0.24
1	1250	25 Yr	5375.00	929.50	946.38	939.41	946.71	0.001514	5.52	1714.57	212.74	0.25
1	1250	50 Yr	6003.00	929.50	947.06	939.91	947.41	0.001551	5.75	1862.14	221.05	0.25
1	1250	100 Yr	6889.00	929.50	947.86	940.57	948.25	0.001635	6.10	2043.91	231.13	0.26
1	1250	500 Yr	8519.00	929.50	949.10	941.64	949.55	0.001810	6.73	2339.59	246.65	0.28

HEC-RAS Plan: Existing River: Noonday Creek Reach: 1

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Fricn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)	Vel Total (ft/s)	Flow Area (sq ft)	
1	-630	2 Yr	935.80	935.43	930.66			164.93	210.96	2242.48	154.55	5.26	3.52	741.11	
1	-630	5 Yr	937.61	937.18	932.05			177.62	480.12	2891.00	342.88	5.90	3.66	1040.91	
1	-630	10 Yr	938.21	937.76	933.40			181.82	590.45	3256.74	418.81	6.10	3.73	1145.01	
1	-630	25 Yr	939.56	939.06	934.38			191.25	876.50	3885.41	613.09	6.55	3.87	1387.44	
1	-630	50 Yr	940.25	939.73	934.81			196.12	1046.11	4230.03	726.87	6.77	3.96	1517.70	
1	-630	100 Yr	941.18	940.63	935.40			202.60	1293.66	4704.04	891.30	7.07	4.06	1695.83	
1	-630	500 Yr	943.10	942.46	936.30			285.68	1501.27	5739.81	1277.93	7.65	3.99	2135.43	
1	0	2 Yr	937.39	937.19	932.26	1.53	0.00	332.73	468.44	2094.67	44.89	4.78	2.99	871.08	
1	0	5 Yr	939.20	938.98	933.89	1.52	0.00	352.74	900.25	2785.19	128.56	5.35	3.17	1203.26	
1	0	10 Yr	939.80	939.57	934.82	1.52	0.00	359.35	1066.64	3030.48	168.88	5.53	3.23	1318.99	
1	0	25 Yr	941.16	940.91	935.66	1.52	0.00	400.14	1491.21	3634.63	249.16	5.97	3.35	1603.47	
1	0	50 Yr	941.85	941.59	936.09	1.52	0.00	427.32	1718.06	3932.44	352.50	6.14	3.40	1767.39	
1	0	100 Yr	942.77	942.49	936.62	1.50	0.00	463.27	2032.78	4332.60	523.62	6.35	3.47	1984.55	
1	0	500 Yr	944.64	944.33	937.48	1.43	0.00	536.32	2623.77	4987.28	907.95	6.50	3.51	2425.89	
1	100	BR D	2 Yr	937.50	937.28	932.73	0.17	0.00	133.98	305.21	2266.30	36.48	5.38	3.76	693.39
1	100	BR D	5 Yr	939.31	939.05	934.42	0.17	0.00	152.57	572.79	3132.06	109.15	6.23	4.02	948.08
1	100	BR D	10 Yr	939.90	939.64	934.94	0.17	0.00	156.73	676.37	3444.33	145.31	6.50	4.10	1039.69
1	100	BR D	25 Yr	941.26	940.97	935.89	0.18	0.00	175.62	935.06	4188.20	251.74	7.08	4.26	1262.23
1	100	BR D	50 Yr	941.95	941.65	936.36	0.18	0.00	178.33	1080.17	4590.81	332.03	7.37	4.34	1382.16
1	100	BR D	100 Yr	942.86	942.55	936.98	0.18	0.00	181.92	1286.15	5149.08	453.78	7.76	4.46	1543.62
1	100	BR D	500 Yr	944.69	944.37	938.00	0.16	0.00	189.20	1682.56	6114.22	722.22	8.18	4.53	1881.44
1	100	BR U	2 Yr	937.66	937.27	932.34	0.16	0.00	124.44	234.88	2309.22	63.90	5.28	3.78	689.18
1	100	BR U	5 Yr	939.48	938.97	934.15	0.17	0.00	148.31	456.16	3210.34	147.50	6.23	4.15	918.98
1	100	BR U	10 Yr	940.08	939.53	934.67	0.18	0.00	156.89	543.04	3534.93	188.02	6.53	4.25	1004.36
1	100	BR U	25 Yr	941.44	940.79	935.69	0.18	0.00	174.88	761.25	4301.58	312.17	7.18	4.42	1215.15
1	100	BR U	50 Yr	942.13	941.44	936.20	0.19	0.00	177.46	885.04	4717.81	400.16	7.50	4.52	1328.61
1	100	BR U	100 Yr	943.05	942.29	936.81	0.19	0.00	180.87	1061.56	5293.15	534.29	7.92	4.65	1481.30
1	100	BR U	500 Yr	944.87	944.05	937.84	0.18	0.00	187.91	1407.00	6279.50	832.51	8.38	4.72	1806.05
1	245		2 Yr	937.92	937.65	932.78	0.26	0.00	238.15	525.30	2030.69	52.01	4.68	2.74	951.79
1	245		5 Yr	939.75	939.45	935.07	0.27	0.00	284.76	1055.73	2644.69	113.58	5.12	2.83	1348.79
1	245		10 Yr	940.35	940.05	935.56	0.27	0.00	301.66	1258.86	2860.19	146.96	5.26	2.86	1469.39
1	245		25 Yr	941.72	941.39	936.37	0.27	0.00	369.49	1768.02	3380.87	226.11	5.58	2.94	1825.76
1	245		50 Yr	942.41	942.08	936.77	0.27	0.00	420.54	2044.63	3645.45	312.92	5.72	2.97	2020.13
1	245		100 Yr	943.32	942.99	937.23	0.27	0.00	449.58	2422.95	3980.77	475.28	5.88	3.02	2279.73
1	245		500 Yr	945.12	944.80	937.93	0.25	0.00	507.21	3129.25	4554.17	835.58	5.97	3.05	2795.07
1	395		2 Yr	938.89	937.23	935.81	0.97	0.00	54.21	2564.90	13.10	10.37	9.99	261.13	
1	395		5 Yr	940.83	938.45	937.67	1.08	0.00	69.53	3758.05	75.95	12.50	11.32	336.98	
1	395		10 Yr	941.46	938.81	938.31	1.11	0.00	74.02	4155.54	110.46	13.23	11.76	362.81	
1	395		25 Yr	942.89	939.68	939.60	1.17	0.00	85.25	0.00	5146.18	228.81	14.66	12.44	432.13
1	395		50 Yr	943.62	940.22	940.22	1.17	0.00	94.05	0.89	5661.60	320.50	15.19	12.51	480.03

HEC-RAS Plan: Existing River: Noonday Creek Reach: 1 (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Crit W/S. (ft)	Fictn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)	Vel Total (ft/s)	Flow Area (sq ft)
1	395	100 Yr	944.57	941.02	941.02	1.10	0.00	107.30	8.01	6394.71	486.28	15.65	12.28	561.05
1	395	500 Yr	946.10	942.49	942.38	0.97	0.00	131.44	49.44	7590.64	878.92	16.10	11.57	736.03
1	590	2 Yr	940.79	940.70	935.99	1.55	0.52	158.01	116.17	2280.28	211.55	5.91	4.02	649.00
1	590	5 Yr	942.84	942.94	938.09	1.53	0.79	176.55	408.96	2964.71	440.33	6.15	3.73	1023.17
1	590	10 Yr	943.53	943.67	938.81	1.54	0.88	182.64	530.35	3205.32	530.33	6.24	3.69	1155.01
1	590	25 Yr	945.05	945.20	940.15	1.57	0.97	195.87	836.40	3785.51	753.09	6.53	3.72	1443.72
1	590	50 Yr	945.81	945.86	940.62	1.56	0.90	203.15	1015.79	4112.50	874.71	6.77	3.82	1572.19
1	590	100 Yr	946.75	946.59	941.24	1.56	0.71	211.22	1258.41	4586.75	1043.84	7.18	4.01	1716.71
1	590	500 Yr	948.24	947.65	942.14	1.54	0.31	222.98	1700.63	5460.58	1357.80	7.97	4.41	1931.20
1	690	BR D	941.21	940.93	936.35	0.26	0.00	142.43	102.14	2311.13	194.73	6.04	4.25	614.00
1	690	BR D	943.37	943.11	938.41	0.22	0.00	155.31	337.63	3076.59	399.78	6.46	4.06	938.69
1	690	BR D	944.09	943.84	939.08	0.21	0.00	159.58	433.10	3352.04	480.86	6.61	4.05	1052.26
1	690	BR D	945.61	945.35	940.40	0.20	0.00	168.50	667.05	4024.79	683.16	7.04	4.13	1300.12
1	690	BR D	946.28	946.00	940.89	0.20	0.00	172.38	793.96	4412.87	796.18	7.35	4.25	1411.76
1	690	BR D	947.05	946.74	941.49	0.21	0.00	176.71	967.42	4967.95	953.63	7.86	4.47	1539.72
1	690	BR D	948.19	947.81	942.46	0.24	0.00	183.07	1285.34	5987.08	1246.58	8.83	4.91	1733.46
1	690	BR U	941.38	941.05	935.46	0.17	0.00	145.73	262.93	2110.61	234.47	5.12	3.16	825.71
1	690	BR U	943.53	943.13	937.58	0.16	0.00	158.01	525.61	2855.11	433.28	5.81	3.34	1141.36
1	690	BR U	944.25	943.82	938.19	0.16	0.00	162.11	628.73	3124.03	513.24	6.03	3.41	1252.52
1	690	BR U	945.77	945.28	939.20	0.16	0.00	170.73	882.14	3777.92	714.94	6.59	3.60	1495.09
1	690	BR U	946.44	945.91	939.68	0.16	0.00	174.44	1021.67	4152.76	828.57	6.96	3.74	1603.59
1	690	BR U	947.22	946.60	940.28	0.18	0.00	178.55	1214.24	4687.48	987.28	7.52	3.99	1726.41
1	690	BR U	948.39	947.61	941.28	0.21	0.00	184.48	1567.11	5669.67	1282.21	8.57	4.46	1908.39
1	780	2 Yr	941.53	941.20	935.78	0.15	0.00	162.14	292.16	2077.58	238.26	5.12	3.10	842.46
1	780	5 Yr	943.67	943.31	937.95	0.14	0.00	179.63	625.06	2736.08	452.86	5.63	3.17	1202.95
1	780	10 Yr	944.39	944.02	938.55	0.14	0.00	185.48	758.86	2967.85	539.29	5.79	3.20	1331.85
1	780	25 Yr	945.91	945.51	939.54	0.15	0.00	199.30	1104.92	3514.92	755.16	6.17	3.32	1617.64
1	780	50 Yr	946.60	946.17	940.07	0.15	0.00	206.59	1306.79	3821.18	875.03	6.43	3.44	1747.18
1	780	100 Yr	947.39	946.91	940.67	0.16	0.00	214.83	1583.59	4262.31	1043.11	6.84	3.63	1855.80
1	780	500 Yr	948.59	948.01	941.61	0.19	0.00	227.04	2090.40	5071.66	1356.95	7.63	4.02	2120.05
1	1250	2 Yr	942.36	942.11	935.85	0.83	0.00	163.49	302.86	2109.17	195.96	4.46	2.86	911.71
1	1250	5 Yr	944.48	944.19	937.84	0.81	0.00	187.50	641.02	2804.73	368.25	4.99	2.99	1276.82
1	1250	10 Yr	945.19	944.88	938.35	0.80	0.00	195.53	781.02	3047.33	437.65	5.14	3.03	1410.14
1	1250	25 Yr	946.71	946.38	939.41	0.79	0.00	212.74	1139.29	3622.65	613.07	5.52	3.13	1714.57
1	1250	50 Yr	947.41	947.06	939.91	0.81	0.00	221.05	1347.09	3943.67	712.25	5.75	3.22	1862.14
1	1250	100 Yr	948.25	947.86	940.57	0.86	0.00	231.13	1642.56	4394.69	851.76	6.10	3.37	2043.91
1	1250	500 Yr	949.55	949.10	941.64	0.97	0.00	246.65	2199.84	5206.43	1112.72	6.73	3.64	2339.59

Plan: Existing Noonday Creek 1 RS: 100 Profile: 50 Yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	942.41			
W.S. US. (ft)	942.08	E.G. Elev (ft)	942.13	941.95
Q Total (cfs)	6003.00	W.S. Elev (ft)	941.44	941.65
Q Bridge (cfs)	6003.00	Crit W.S. (ft)	936.20	936.36
Q Weir (cfs)		Max Chl Dpth (ft)	15.20	15.79
Weir Sta Lft (ft)		Vel Total (ft/s)	4.52	4.34
Weir Sta Rgt (ft)		Flow Area (sq ft)	1328.61	1382.16
Weir Submerg		Froude # Chl	0.36	0.35
Weir Max Depth (ft)		Specif Force (cu ft)	7913.32	7792.39
Min El Weir Flow (ft)	957.94	Hydr Depth (ft)	7.49	7.75
Min El Prs (ft)	956.32	W.P. Total (ft)	210.50	214.52
Delta EG (ft)	0.56	Conv. Total (cfs)	106785.6	107866.4
Delta WS (ft)	0.49	Top Width (ft)	177.46	178.33
BR Open Area (sq ft)	4235.47	Frctn Loss (ft)	0.19	0.18
BR Open Vel (ft/s)	4.52	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	1.25	1.25
Br Sel Method	WSPRO	Power Total (lb/ft s)	5.63	5.41

Plan: Existing Noonday Creek 1 RS: 100 Profile: 100 Yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	943.32			
W.S. US. (ft)	942.99	E.G. Elev (ft)	943.05	942.86
Q Total (cfs)	6889.00	W.S. Elev (ft)	942.29	942.55
Q Bridge (cfs)	6889.00	Crit W.S. (ft)	936.81	936.98
Q Weir (cfs)		Max Chl Dpth (ft)	16.05	16.69
Weir Sta Lft (ft)		Vel Total (ft/s)	4.65	4.46
Weir Sta Rgt (ft)		Flow Area (sq ft)	1481.30	1543.62
Weir Submerg		Froude # Chl	0.37	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	9337.80	9248.62
Min El Weir Flow (ft)	957.94	Hydr Depth (ft)	8.19	8.49
Min El Prs (ft)	956.32	W.P. Total (ft)	217.72	222.11
Delta EG (ft)	0.56	Conv. Total (cfs)	120808.6	122817.2
Delta WS (ft)	0.50	Top Width (ft)	180.87	181.92
BR Open Area (sq ft)	4235.47	Frctn Loss (ft)	0.19	0.18
BR Open Vel (ft/s)	4.65	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	1.38	1.37
Br Sel Method	WSPRO	Power Total (lb/ft s)	6.42	6.09

Plan: Existing Noonday Creek 1 RS: 100 Profile: 500 Yr

		Element	Inside BR US	Inside BR DS
E.G. US. (ft)	945.12			
W.S. US. (ft)	944.80	E.G. Elev (ft)	944.87	944.69
Q Total (cfs)	8519.00	W.S. Elev (ft)	944.05	944.37
Q Bridge (cfs)	8519.00	Crit W.S. (ft)	937.84	938.00
Q Weir (cfs)		Max Chl Dpth (ft)	17.81	18.51
Weir Sta Lft (ft)		Vel Total (ft/s)	4.72	4.53
Weir Sta Rgt (ft)		Flow Area (sq ft)	1806.05	1881.44
Weir Submerg		Froude # Chl	0.37	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	12613.30	12607.49
Min El Weir Flow (ft)	957.94	Hydr Depth (ft)	9.61	9.94
Min El Prs (ft)	956.32	W.P. Total (ft)	232.64	237.54
Delta EG (ft)	0.49	Conv. Total (cfs)	152393.5	155914.9
Delta WS (ft)	0.47	Top Width (ft)	187.91	189.20
BR Open Area (sq ft)	4235.47	Frctn Loss (ft)	0.18	0.16
BR Open Vel (ft/s)	4.72	C & E Loss (ft)	0.00	0.00

Plan: Existing Noonday Creek 1 RS: 100 Profile: 500 Yr (Continued)

Coef of Q	1.00	Shear Total (lb/sq ft)	1.51	1.48
Br Sel Method	WSPRO	Power Total (lb/ft s)	7.14	6.68

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

X	X	XXXXXX	XXXX	XXXX	XX	XXXX
X	X	X	X X	X X	X X	X
X	X	X	X	X X	X X	X
XXXXXX	XXXX	X	XXX	XXXX	XXXXXX	XXXX
X	X	X	X	X X	X X	X
X	X	X	X X	X X	X X	X
X	X	XXXXXX	XXXX	X X	X X	XXXXX

PROJECT DATA

Project Title: I75@Noonday
Project File : I75@Noonday.prj
Run Date and Time: 9/18/2009 11:24:58 AM

Project in English units

PLAN DATA

Plan Title: Existing
Plan File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.p03

Geometry Title: Existing
Geometry File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.g03

Flow Title : Urban 25%
Flow File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.f01

Plan Summary Information:

Number of: Cross Sections = 7 Multiple Openings = 0
 Culverts = 0 Inline Structures = 0
 Bridges = 2 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Urban 25%
Flow File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.f01

Flow Data (cfs)

River	Reach	RS	2 Yr	5 Yr	10
Yr	25 Yr	50 Yr	100 Yr	500 Yr	
Noonday Creek	1	1250		2608	3814
4266	5375	6003	6889	8519	

Boundary Conditions

River Downstream	Reach	Profile	Upstream
Noonday Creek 1		2 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		5 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		10 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		25 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		50 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		100 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		500 Yr	Normal S = 0.00285
Normal S = 0.00285			

GEOMETRY DATA

Geometry Title: Existing
 Geometry File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.g03

CROSS SECTION

RIVER: Noonday Creek
 REACH: 1 RS: 1250

INPUT
 Description: Approach
 Station Elevation Data num= 12

Sta	Elev								
4819	951.6	4864	946.6	4900	942.1	4950	937.3	4980	936.6
4988	929.5	5000	929.5	5015	930.5	5023	936.8	5045	936.9
5125	959.5	5160	972.3						

 Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4819	.13	4980	.06	5023	.13

 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4980 5023 400 460 480 .3 .5

CROSS SECTION

RIVER: Noonday Creek
 REACH: 1 RS: 790

INPUT
 Description: Upstream SBL
 Station Elevation Data num= 13

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4816	955	4851	950	4886	945	4907	940	4924	938
4978	936.6	4987	930.2	5000	928.1	5012	930.2	5016	935
5051	938	5096	949	5176	965				

 Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4816	.13	4978	.06	5016	.13

 Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4978 5016 200 200 200 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4816 4886 960.56 T
 5126 5176 960.62 T

BRIDGE

RIVER: Noonday Creek
 REACH: 1 RS: 690

INPUT

Description: SB Bridge

Distance from Upstream XS = 70
 Deck/Roadway Width = 60
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates

num= 6
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 4771 961 0 4886 960.56 0 4886 960.56 955.93
 5126 960.62 956.43 5126 960.62 0 5476 965 0

Upstream Bridge Cross Section Data

Station Elevation Data num= 13
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4816 954.68 4851 949.68 4886 944.68 4907 939.68 4924 937.68
 4978 936.28 4987 929.88 5000 927.78 5012 929.88 5016 934.68
 5051 937.68 5096 948.68 5176 964.68

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4816 .13 4978 .06 5016 .13

Bank Sta: Left Right Coeff Contr. Expan.
 4978 5016 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4816 4886 960.56 T
 5126 5176 960.62 T

Downstream Deck/Roadway Coordinates

num= 6
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 4771 961 0 4886 960.56 0 4886 960.56 955.93
 5126 960.62 956.43 5126 960.62 0 5476 965 0

Downstream Bridge Cross Section Data

Station Elevation Data num= 13
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4816 955.32 4851 950.32 4886 945.32 4907 940.32 4924 938.32
 4973 940.12 4993 928.62 5000 927.52 5006 928.72 5016 936.32
 5051 938.32 5096 949.32 5176 965.32

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4816 .13 4973 .06 5016 .13

Bank Sta: Left Right Coeff Contr. Expan.
 4973 5016 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4816 4886 960.56 T
 5126 5176 960.62 T

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
 Downstream Embankment side slope = 2 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data

Upstream num= 2
 Sta Elev Sta Elev
 4886 955.93 4926 933.93
 Downstream num= 2
 Sta Elev Sta Elev
 4886 955.93 4926 933.93

Abutment Data

Upstream num= 2
 Sta Elev Sta Elev
 5086 936.43 5126 956.43
 Downstream num= 2

Sta	Elev	Sta	Elev
5086	936.43	5126	956.43

Number of Piers = 2

Pier Data

Pier Station	Upstream=	4966	Downstream=	4966
Upstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	957	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	957	

Pier Data

Pier Station	Upstream=	5046	Downstream=	5046
Upstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	957	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	957	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

W.S. Pro Method

W.S.Pro Data

Left Embankment	
El of the top of the embankment	= 960.56
El of the toe of the abutment	= 939.54
Right Embankment	
El of the top of the embankment	= 960.62
El of the toe of the abutment	= 937.82
Abutment Type	= 3 Sloping abutments and sloping embankments
Slope of abutments	= 2
Top width of embankment	= 60
Centroid station of bridge opening	=
Wing Wall Type	= No wing walls present
Width	=
Angle	=
Radius	=
Guide Banks Type	= No Guide Bank present
Length	=
Offset	=
Angle	=

Selected Low Flow Methods = W.S.Pro Method

High Flow Method

Pressure and Weir flow	
Submerged Inlet Cd	=
Submerged Inlet + Outlet Cd	= .8
Max Low Cord	=

Additional Bridge Parameters

Add Friction component to Momentum	
Do not add Weight component to Momentum	
Class B flow critical depth computations use critical depth	
inside the bridge at the upstream end	
Criteria to check for pressure flow = Upstream energy grade line	

CROSS SECTION

RIVER: Noonday Creek

REACH: 1

RS: 590

INPUT

Description: Downstream SBL

Station	Elevation	Data	num=	13	Sta	Elev	Sta	Elev	Sta	Elev
4816	955	4851	950	4886	945	4907	940	4924	938	
4973	939.8	4993	928.3	5000	927.2	5006	928.4	5016	936	
5051	938	5096	949	5176	965					

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4816 .13 4973 .06 5016 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4973 5016 140 195 235 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4816 4886 960.56 T
 5126 5176 960.62 T

CROSS SECTION

RIVER: Noonday Creek
 REACH: 1 RS: 395

INPUT
 Description: Middle Section - adj elev +0.1
 Station Elevation Data num= 8
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4894 950.1 4953 943.1 4973 939.6 4993 928.1 5000 927
 5006 928.2 5016 935.8 5116 945.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4894 .13 4973 .06 5016 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4973 5016 95 150 190 .5 .7

CROSS SECTION

RIVER: Noonday Creek
 REACH: 1 RS: 245

INPUT
 Description: Upstream NBL
 Station Elevation Data num= 14
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4529 950 4629 946 4779 940 4849 935 4919 934
 4979 934 4987 926.7 5000 926.7 5014 927.2 5025 933
 5052 938 5092 941 5147 942 5202 950

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4529 .13 4979 .06 5025 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4979 5025 245 245 245 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4529 4840 957.93 T
 5125 5202 959.44 T

BRIDGE

RIVER: Noonday Creek
 REACH: 1 RS: 100

INPUT
 Description: NB Bridge
 Distance from Upstream XS = 115
 Deck/Roadway Width = 60
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 8
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 4405 963 4645 960 0 4885 957.93 0
 4885 957.93 954.82 5125 959.44 956.32 5125 959.44 0
 5355 963 0 5585 966.56

Upstream Bridge Cross Section Data

Station Elevation Data num= 14
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

4529	949.54	4629	945.54	4779	939.54	4849	934.54	4919	933.54
4979	933.54	4987	926.24	5000	926.24	5014	926.74	5025	932.54
5052	937.54	5092	940.54	5147	941.54	5202	949.54		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4529 .13 4979 .06 5025 .13

Bank Sta: Left Right Coeff Contr. Expan.
 4979 5025 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4529 4840 957.93 T
 5125 5202 959.44 T

Downstream Deck/Roadway Coordinates

num= 8									
Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4405	963				4645	960	0	4885	957.93 0
4885	957.93	954.82			5125	959.44	956.32	5125	959.44 0
5355	963		0		5585	966.56			

Downstream Bridge Cross Section Data

Station Elevation Data num= 11									
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4701	948.46	4731	937.46	4926	934.46	4986	932.26	4990	927.06
5000	925.86	5025	929.26	5032	933.96	5087	940.46	5272	945.46
5417	955.46								

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4701 .13 4986 .06 5032 .13

Bank Sta: Left Right Coeff Contr. Expan.
 4986 5032 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4701 4885 957.93 T
 5125 5417 959.44 T

Upstream Embankment side slope = 2 horiz. to 1.0 vertical
 Downstream Embankment side slope = 2 horiz. to 1.0 vertical
 Maximum allowable submergence for weir flow = .98
 Elevation at which weir flow begins =
 Energy head used in spillway design =
 Spillway height used in design =
 Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data

Upstream num= 2									
Sta	Elev	Sta	Elev						
4885	954.82	4945	924.82						
Downstream num= 2									
Sta	Elev	Sta	Elev						
4885	954.82	4945	924.82						

Abutment Data

Upstream num= 2									
Sta	Elev	Sta	Elev						
5065	926.32	5125	956.32						
Downstream num= 2									
Sta	Elev	Sta	Elev						
5065	926.32	5125	956.32						

Number of Piers = 2

Pier Data
 Pier Station Upstream= 4965 Downstream= 4965
 Upstream num= 2
 Width Elev Width Elev
 3 0 3 958
 Downstream num= 2
 Width Elev Width Elev
 3 0 3 958

Pier Data

Pier Station	Upstream=	5045	Downstream=	5045
Upstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	958	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	958	

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
W.S. Pro Method

W.S.Pro Data

Left Embankment

El of the top of the embankment	=	957.93
El of the toe of the abutment	=	933.82

Right Embankment

El of the top of the embankment	=	959.44
El of the toe of the abutment	=	941.18

Abutment Type	=	3 Sloping abutments and sloping embankments
Slope of abutments	=	2
Top width of embankment	=	60
Centroid station of bridge opening	=	
Wing Wall Type	=	No wing walls present
Width	=	
Angle	=	
Radius	=	
Guide Banks Type	=	No Guide Bank present
Length	=	
Offset	=	
Angle	=	

Selected Low Flow Methods = W.S.Pro Method

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd	=	
Submerged Inlet + Outlet Cd	=	.8
Max Low Cord	=	

Additional Bridge Parameters

Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 0

INPUT

Description: Downstream NBL

Station	Elevation	Data	num=	11					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4701	948	4731	937	4926	934	4986	931.8	4990	926.6
5000	925.4	5025	928.8	5032	933.5	5087	940	5272	945
5417	955								

Manning's n Values num= 3

Sta	n Val	Sta	n Val	Sta	n Val
4701	.13	4986	.06	5032	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff Contr.	Expan.
	4986	5032		600	630	650	.5	.7

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4701	4885	957.93	T
5125	5417	959.44	T

CROSS SECTION

RIVER: Noonday Creek

REACH: 1

RS: -630

INPUT

Description: Exit

Station	Elevation	Data	num=	13	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4802	941.9	4867	941.5	4875	941.8	4923	932	4944	932.7	4944	932.7	
4977	932.7	4981	926.3	5000	925	5020	926	5023	932.6	5023	932.6	
5064	932.4	5092	944.3	5137	945.6							

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4802	.13	4977	.06	5023	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
				0	0	0	.1		.3
	4977	5023							

SUMMARY OF MANNING'S N VALUES

River: Noonday Creek

Reach	River Sta.	n1	n2	n3
1	1250	.13	.06	.13
1	790	.13	.06	.13
1	690	Bridge		
1	590	.13	.06	.13
1	395	.13	.06	.13
1	245	.13	.06	.13
1	100	Bridge		
1	0	.13	.06	.13
1	-630	.13	.06	.13

SUMMARY OF REACH LENGTHS

River: Noonday Creek

Reach	River Sta.	Left	Channel	Right
1	1250	400	460	480
1	790	200	200	200
1	690	Bridge		
1	590	140	195	235
1	395	95	150	190
1	245	245	245	245
1	100	Bridge		
1	0	600	630	650
1	-630	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Noonday Creek

Reach	River Sta.	Contr.	Expan.
1	1250	.3	.5
1	790	.3	.5
1	690	Bridge	
1	590	.3	.5
1	395	.5	.7
1	245	.5	.7
1	100	Bridge	
1	0	.5	.7
1	-630	.1	.3

HEC-RAS PROPOSED BRIDGE MODEL

HEC-RAS Plan: Proposed River: Noonday Creek Reach: 1

Reach	River Sta	Profile	Q Total (cfs)	Min Ch El (ft)	W.S. Elev (ft)	Crit W.S. (ft)	E.G. Elev (ft)	E.G. Slope (ft/ft)	Vel Chnl (ft/s)	Flow Area (sq ft)	Top Width (ft)	Froude # Chl
1	-630	2 Yr	2608.00	925.00	935.43	930.66	935.80	0.002855	5.26	741.11	164.93	0.30
1	-630	50 Yr	6003.00	925.00	939.73	934.81	940.25	0.002852	6.77	1517.70	196.12	0.32
1	-630	100 Yr	6889.00	925.00	940.63	935.40	941.18	0.002852	7.07	1695.83	202.60	0.33
1	-630	500 Yr	8519.00	925.00	942.46	936.30	943.10	0.002850	7.65	2135.43	285.68	0.33
1	0	2 Yr	2608.00	925.40	937.19	932.26	937.39	0.002076	4.78	871.09	332.73	0.27
1	0	50 Yr	6003.00	925.40	941.59	936.09	941.85	0.002064	6.14	1767.39	427.32	0.29
1	0	100 Yr	6889.00	925.40	942.49	936.62	942.77	0.002031	6.35	1984.55	463.27	0.29
1	0	500 Yr	8519.00	925.40	944.33	937.48	944.64	0.001823	6.50	2425.86	536.32	0.28
1	100	Bridge										
1	245	2 Yr	2608.00	926.70	937.65	932.78	937.92	0.002017	4.68	953.17	238.28	0.27
1	245	50 Yr	6003.00	926.70	942.10	936.77	942.43	0.001790	5.70	2026.74	421.28	0.27
1	245	100 Yr	6889.00	926.70	943.02	937.23	943.35	0.001734	5.86	2287.38	450.43	0.27
1	245	500 Yr	8519.00	926.70	944.83	937.93	945.15	0.001536	5.95	2803.84	508.19	0.26
1	395	2 Yr	2608.00	927.00	937.23	935.81	938.89	0.017267	10.36	261.49	54.29	0.72
1	395	50 Yr	6003.00	927.00	940.22	940.22	943.62	0.024936	15.19	480.03	94.05	0.91
1	395	100 Yr	6889.00	927.00	941.02	941.02	944.57	0.023518	15.65	561.05	107.30	0.89
1	395	500 Yr	8519.00	927.00	942.64	942.38	946.10	0.019485	15.82	755.35	133.84	0.84
1	590	2 Yr	2608.00	927.20	940.70	935.99	940.79	0.003612	5.91	648.70	157.99	0.35
1	590	50 Yr	6003.00	927.20	945.86	940.62	945.81	0.002587	6.77	1572.19	203.15	0.32
1	590	100 Yr	6889.00	927.20	946.59	941.24	946.75	0.002723	7.18	1716.71	211.22	0.33
1	590	500 Yr	8519.00	927.20	947.56	942.14	948.20	0.003144	8.04	1912.99	221.99	0.36
1	690	Bridge										
1	790	2 Yr	2608.00	928.10	941.20	935.78	941.53	0.002119	5.12	842.23	162.13	0.28
1	790	50 Yr	6003.00	928.10	946.17	940.07	946.60	0.002006	6.43	1747.18	206.59	0.29
1	790	100 Yr	6889.00	928.10	946.91	940.67	947.39	0.002138	6.84	1895.80	214.83	0.30
1	790	500 Yr	8519.00	928.10	947.93	941.61	948.52	0.002488	7.68	2103.82	226.17	0.32
1	1250	2 Yr	2608.00	929.50	942.11	935.85	942.36	0.001531	4.46	911.56	163.48	0.24
1	1250	50 Yr	6003.00	929.50	947.06	939.91	947.41	0.001551	5.75	1862.14	221.05	0.25
1	1250	100 Yr	6889.00	929.50	947.86	940.57	948.25	0.001635	6.10	2043.91	231.13	0.26
1	1250	500 Yr	8519.00	929.50	949.04	941.64	949.50	0.001836	6.77	2325.34	245.93	0.28

HEC-RAS Plan: Proposed River: Noonday Creek Reach: 1

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Friction Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)	Vel Total (ft/s)	Flow Area (sq ft)
1	-630	2 Yr	935.80	935.43	930.66			164.93	210.96	2242.48	154.55	5.26	3.52	741.11
1	-630	50 Yr	940.25	939.73	934.81			196.12	1046.11	4230.03	726.87	6.77	3.96	1517.70
1	-630	100 Yr	941.18	940.63	935.40			202.60	1293.66	4704.04	891.30	7.07	4.06	1695.83
1	-630	500 Yr	943.10	942.46	936.30			285.68	1501.27	5739.81	1277.93	7.65	3.99	2135.43
1	0	2 Yr	937.39	937.19	932.26	1.53	0.00	332.73	468.45	2094.66	44.89	4.78	2.99	871.09
1	0	50 Yr	941.85	941.59	936.09	1.52	0.00	427.32	1718.06	3932.44	352.50	6.14	3.40	1767.39
1	0	100 Yr	942.77	942.49	936.62	1.50	0.00	463.27	2032.78	4332.60	523.62	6.35	3.47	1984.55
1	0	500 Yr	944.64	944.33	937.48	1.43	0.00	536.32	2623.76	4987.30	907.94	6.50	3.51	2425.86
1	100	BR D	937.50	937.28	932.73	0.17	0.00	133.98	305.21	2266.30	36.48	5.38	3.76	693.39
1	100	BR D	941.95	941.65	936.36	0.18	0.00	178.33	1080.17	4590.81	332.03	7.37	4.34	1382.16
1	100	BR D	942.86	942.55	936.98	0.18	0.00	181.92	1286.15	5149.08	453.78	7.76	4.46	1543.62
1	100	BR D	944.69	944.37	938.00	0.16	0.00	189.20	1682.55	6114.23	722.21	8.18	4.53	1881.42
1	100	BR U	937.77	937.40	932.34	0.27	0.00	125.38	241.57	2299.86	66.57	5.19	3.70	705.01
1	100	BR U	942.27	941.59	936.20	0.32	0.00	178.09	892.90	4697.59	412.51	7.38	4.43	1356.56
1	100	BR U	943.19	942.45	936.81	0.33	0.00	181.52	1069.51	5271.49	548.00	7.80	4.56	1510.61
1	100	BR U	945.00	944.20	937.84	0.31	0.00	188.53	1414.11	6258.69	846.20	8.28	4.64	1835.06
1	245	2 Yr	937.92	937.65	932.78	0.15	0.00	238.28	526.17	2029.71	52.12	4.68	2.74	953.17
1	245	50 Yr	942.43	942.10	936.77	0.16	0.00	421.28	2046.55	3640.86	315.59	5.70	2.96	2026.74
1	245	100 Yr	943.35	943.02	937.23	0.16	0.00	450.43	2424.93	3985.51	478.56	5.86	3.01	2287.38
1	245	500 Yr	945.15	944.83	937.93	0.15	0.00	508.19	3131.05	4548.58	839.36	5.95	3.04	2803.84
1	395	2 Yr	938.89	937.23	935.81	0.97	0.00	54.29		2594.76	13.24	10.36	9.97	261.49
1	395	50 Yr	943.62	940.22	940.22	1.17	0.00	94.05	0.89	5681.60	320.50	15.19	12.51	480.03
1	395	100 Yr	944.57	941.02	941.02	1.10	0.00	107.30	8.01	6394.71	486.28	15.65	12.28	561.05
1	395	500 Yr	946.10	942.64	942.38	0.94	0.00	133.84	54.90	7557.44	906.66	15.82	11.28	755.35
1	590	2 Yr	940.79	940.70	935.99	1.54	0.52	157.99	116.02	2280.52	211.46	5.91	4.02	648.70
1	590	50 Yr	945.81	945.86	940.62	1.56	0.90	203.15	1015.79	4112.50	874.71	6.77	3.82	1572.19
1	590	100 Yr	946.75	941.24	946.59	1.56	0.71	211.22	1258.41	4586.75	1043.84	7.18	4.01	1716.71
1	590	500 Yr	948.20	947.56	942.14	1.52	0.24	221.99	1689.41	5477.22	1352.37	8.04	4.45	1912.99
1	690	BR D	941.21	940.93	936.35	0.26	0.00	142.42	102.03	2311.32	194.65	6.05	4.25	613.76
1	690	BR D	946.28	946.00	940.89	0.20	0.00	172.38	793.96	4412.87	796.18	7.35	4.25	1411.76
1	690	BR D	947.05	941.49	941.49	0.21	0.00	176.71	967.42	4967.95	953.63	7.86	4.47	1539.72
1	690	BR D	948.11	947.73	942.46	0.24	0.00	182.57	1278.86	5998.64	1241.50	8.89	4.96	1718.02
1	690	BR U	941.38	941.05	935.46	0.17	0.00	145.72		2110.74	234.41	5.12	3.16	825.49
1	690	BR U	946.44	945.91	939.68	0.16	0.00	174.44	1021.67	4152.76	828.57	6.96	3.74	1603.59
1	690	BR U	947.22	946.60	940.28	0.18	0.00	178.55	1214.24	4687.48	987.28	7.52	3.99	1726.41
1	690	BR U	948.32	947.52	941.28	0.21	0.00	183.97	1561.90	5679.96	1277.15	8.63	4.50	1892.68

HEC-RAS Plan: Proposed River: Noonday Creek Reach: 1 (Continued)

Reach	River Sta	Profile	E.G. Elev (ft)	W.S. Elev (ft)	Crit W.S. (ft)	Fictn Loss (ft)	C & E Loss (ft)	Top Width (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Vel Chnl (ft/s)	Vel Total (ft/s)	Flow Area (sq ft)
1	790	2 Yr	941.53	941.20	935.78	0.15	0.00	162.13	292.05	2077.75	238.20	5.12	3.10	844.23
1	790	50 Yr	946.60	946.17	940.07	0.15	0.00	206.59	1306.79	3821.18	875.03	6.43	3.44	1747.18
1	790	100 Yr	947.39	946.91	940.67	0.16	0.00	214.83	1583.59	4262.31	1043.11	6.84	3.63	1895.80
1	790	500 Yr	948.52	947.93	941.61	0.20	0.00	226.17	2081.70	5085.01	1352.30	7.68	4.05	2103.82
1	1250	2 Yr	942.36	942.11	935.85	0.83	0.00	163.48	302.80	2109.27	195.94	4.46	2.86	911.56
1	1250	50 Yr	947.41	947.06	939.91	0.81	0.00	221.05	1347.09	3943.67	712.25	5.75	3.22	1862.14
1	1250	100 Yr	948.25	947.86	940.57	0.86	0.00	231.13	1642.56	4394.69	851.76	6.10	3.37	2043.91
1	1250	500 Yr	949.50	949.04	941.64	0.99	0.00	245.93	2192.33	5216.57	1110.09	6.77	3.66	2325.34

Plan: Proposed Noonday Creek 1 RS: 100 Profile: 50 Yr

E.G. US. (ft)	942.43	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	942.10	E.G. Elev (ft)	942.27	941.95
Q Total (cfs)	6003.00	W.S. Elev (ft)	941.59	941.65
Q Bridge (cfs)	6003.00	Crit W.S. (ft)	936.20	936.36
Q Weir (cfs)		Max Chl Dpth (ft)	15.35	15.79
Weir Sta Lft (ft)		Vel Total (ft/s)	4.43	4.34
Weir Sta Rgt (ft)		Flow Area (sq ft)	1356.56	1382.16
Weir Submerg		Froude # Chl	0.35	0.35
Weir Max Depth (ft)		Specif Force (cu ft)	8102.75	7792.39
Min El Weir Flow (ft)	957.94	Hydr Depth (ft)	7.62	7.75
Min El Prs (ft)	956.32	W.P. Total (ft)	211.83	214.52
Delta EG (ft)	0.58	Conv. Total (cfs)	109308.6	107866.4
Delta WS (ft)	0.51	Top Width (ft)	178.09	178.33
BR Open Area (sq ft)	4235.47	Frctn Loss (ft)	0.32	0.18
BR Open Vel (ft/s)	4.43	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	1.21	1.25
Br Sel Method	WSPRO	Power Total (lb/ft s)	5.34	5.41

Plan: Proposed Noonday Creek 1 RS: 100 Profile: 100 Yr

E.G. US. (ft)	943.35	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	943.02	E.G. Elev (ft)	943.19	942.86
Q Total (cfs)	6889.00	W.S. Elev (ft)	942.45	942.55
Q Bridge (cfs)	6889.00	Crit W.S. (ft)	936.81	936.98
Q Weir (cfs)		Max Chl Dpth (ft)	16.21	16.69
Weir Sta Lft (ft)		Vel Total (ft/s)	4.56	4.46
Weir Sta Rgt (ft)		Flow Area (sq ft)	1510.61	1543.62
Weir Submerg		Froude # Chl	0.36	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	9554.90	9248.62
Min El Weir Flow (ft)	957.94	Hydr Depth (ft)	8.32	8.49
Min El Prs (ft)	956.32	W.P. Total (ft)	219.09	222.11
Delta EG (ft)	0.58	Conv. Total (cfs)	123564.9	122817.2
Delta WS (ft)	0.52	Top Width (ft)	181.52	181.92
BR Open Area (sq ft)	4235.47	Frctn Loss (ft)	0.33	0.18
BR Open Vel (ft/s)	4.56	C & E Loss (ft)	0.00	0.00
Coef of Q	1.00	Shear Total (lb/sq ft)	1.34	1.37
Br Sel Method	WSPRO	Power Total (lb/ft s)	6.10	6.09

Plan: Proposed Noonday Creek 1 RS: 100 Profile: 500 Yr

E.G. US. (ft)	945.15	Element	Inside BR US	Inside BR DS
W.S. US. (ft)	944.83	E.G. Elev (ft)	945.00	944.69
Q Total (cfs)	8519.00	W.S. Elev (ft)	944.20	944.37
Q Bridge (cfs)	8519.00	Crit W.S. (ft)	937.84	938.00
Q Weir (cfs)		Max Chl Dpth (ft)	17.96	18.51
Weir Sta Lft (ft)		Vel Total (ft/s)	4.64	4.53
Weir Sta Rgt (ft)		Flow Area (sq ft)	1835.06	1881.42
Weir Submerg		Froude # Chl	0.36	0.36
Weir Max Depth (ft)		Specif Force (cu ft)	12867.59	12607.28
Min El Weir Flow (ft)	957.94	Hydr Depth (ft)	9.73	9.94
Min El Prs (ft)	956.32	W.P. Total (ft)	233.94	237.54
Delta EG (ft)	0.52	Conv. Total (cfs)	155320.3	155912.7
Delta WS (ft)	0.50	Top Width (ft)	188.53	189.20
BR Open Area (sq ft)	4235.47	Frctn Loss (ft)	0.31	0.16
BR Open Vel (ft/s)	4.64	C & E Loss (ft)	0.00	0.00

Plan: Proposed Noonday Creek 1 RS: 100 Profile: 500 Yr (Continued)

Coef of Q	1.00	Shear Total (lb/sq ft)	1.47	1.48
Br Sel Method	WSPRO	Power Total (lb/ft s)	6.84	6.68

HEC-RAS Version 4.0.0 March 2008
U.S. Army Corps of Engineers
Hydrologic Engineering Center
609 Second Street
Davis, California

X	X	XXXXXX	XXXX	XXXX	XX	XXXX
X	X	X	X X	X X	X X	X
X	X	X	X	X X	X X	X
XXXXXXX	XXXX	X	XXX	XXXX	XXXXXX	XXXX
X	X	X	X	X X	X X	X
X	X	X	X X	X X	X X	X
X	X	XXXXXX	XXXX	X X	X X	XXXXXX

PROJECT DATA

Project Title: I75@Noonday
Project File : I75@Noonday.prj
Run Date and Time: 9/18/2009 11:25:30 AM

Project in English units

PLAN DATA

Plan Title: Proposed
Plan File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.p02

Geometry Title: Proposed
Geometry File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.g02

Flow Title : Urban 25%
Flow File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.f01

Plan Summary Information:

Number of: Cross Sections = 7 Multiple Openings = 0
 Culverts = 0 Inline Structures = 0
 Bridges = 2 Lateral Structures = 0

Computational Information

Water surface calculation tolerance = 0.01
Critical depth calculation tolerance = 0.01
Maximum number of iterations = 20
Maximum difference tolerance = 0.3
Flow tolerance factor = 0.001

Computation Options

Critical depth computed only where necessary
Conveyance Calculation Method: At breaks in n values only
Friction Slope Method: Average Conveyance
Computational Flow Regime: Subcritical Flow

FLOW DATA

Flow Title: Urban 25%
Flow File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.f01

Flow Data (cfs)

River	Reach	RS	2 Yr	5 Yr	10
Yr	25 Yr	50 Yr	100 Yr	500 Yr	
Noonday Creek	1	1250		2608	3814
4266	5375	6003	6889	8519	

Boundary Conditions

River Downstream	Reach	Profile	Upstream
Noonday Creek 1		2 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		5 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		10 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		25 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		50 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		100 Yr	Normal S = 0.00285
Normal S = 0.00285			
Noonday Creek 1		500 Yr	Normal S = 0.00285
Normal S = 0.00285			

GEOMETRY DATA

Geometry Title: Proposed

Geometry File : n:\TRA\255717\Hydraulics\I75@Noonday\HECRAS\Preliminary 2\I75@Noonday.g02

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 1250

INPUT

Description: Approach

Station	Elevation	Data	num=	12					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4819	951.6	4864	946.6	4900	942.1	4950	937.3	4980	936.6
4988	929.5	5000	929.5	5015	930.5	5023	936.8	5045	936.9
5125	959.5	5160	972.3						

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4819	.13	4980	.06	5023	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4980	5023		400	460	480	.	.3	.5

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 790

INPUT

Description: Upstream SBL

Station	Elevation	Data	num=	13					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4816	955	4851	950	4886	945	4907	940	4924	938
4978	936.6	4987	930.2	5000	928.1	5012	930.2	5016	935
5051	938	5096	949	5176	965				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4816	.13	4978	.06	5016	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
	4978	5016		200	200	200	.	.3	.5

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
4816	4886	960.56	T
5126	5176	960.62	T

BRIDGE

RIVER: Noonday Creek

REACH: 1 RS: 690

INPUT

Description: SB Bridge

Distance from Upstream XS = 70

Deck/Roadway Width = 60

Weir Coefficient = 2.6

Upstream Deck/Roadway Coordinates

num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4771	961	0	4886	960.56	0	4886	960.56	955.93						
5126	960.62	956.43	5126	960.62	0	5476	965	0						

Upstream Bridge Cross Section Data

Station Elevation Data num= 13

Sta	Elev								
4816	954.68	4851	949.68	4886	944.68	4907	939.68	4924	937.68
4978	936.28	4987	929.88	5000	927.78	5012	929.88	5016	934.68
5051	937.68	5096	948.68	5176	964.68				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4816	.13	4978	.06	5016	.13

Bank Sta: Left Right Coeff Contr. Expan.

4978 5016 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4816	4886	960.56	T
5126	5176	960.62	T

Downstream Deck/Roadway Coordinates

num= 6

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4771	961	0	4886	960.56	0	4886	960.56	955.93	
5126	960.62	956.43	5126	960.62	0	5476	965	0	

Downstream Bridge Cross Section Data

Station Elevation Data num= 13

Sta	Elev								
4816	955.32	4851	950.32	4886	945.32	4907	940.32	4924	938.32
4973	940.12	4993	928.62	5000	927.52	5006	928.72	5016	936.32
5051	938.32	5096	949.32	5176	965.32				

Manning's n Values

Sta	n Val	Sta	n Val	Sta	n Val
4816	.13	4973	.06	5016	.13

Bank Sta: Left Right Coeff Contr. Expan.

4973 5016 .3 .5

Ineffective Flow num= 2

Sta L	Sta R	Elev	Permanent
4816	4886	960.56	T
5126	5176	960.62	T

Upstream Embankment side slope = 2 horiz. to 1.0 vertical

Downstream Embankment side slope = 2 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data

Upstream num= 2

Sta	Elev	Sta	Elev
4886	955.93	4926	933.93

Downstream num= 2

Sta	Elev	Sta	Elev
4886	955.93	4926	933.93

Abutment Data

Upstream num= 2

Sta	Elev	Sta	Elev
5086	936.43	5126	956.43

Downstream num= 2

Sta	Elev	Sta	Elev
5086	936.43	5126	956.43

Number of Piers = 2

Pier Data

Pier Station	Upstream=	4966	Downstream=	4966
--------------	-----------	------	-------------	------

Upstream	num=	2
----------	------	---

Width	Elev	Width	Elev
3	0	3	957

Downstream	num=	2
------------	------	---

Width	Elev	Width	Elev
3	0	3	957

Pier Data

Pier Station	Upstream=	5046	Downstream=	5046
--------------	-----------	------	-------------	------

Upstream	num=	2
----------	------	---

Width	Elev	Width	Elev
3	0	3	957

Downstream	num=	2
------------	------	---

Width	Elev	Width	Elev
3	0	3	957

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data

W.S. Pro Method

W.S.Pro Data

Left Embankment

El of the top of the embankment = 960.56

El of the toe of the abutment = 939.54

Right Embankment

El of the top of the embankment = 960.62

El of the toe of the abutment = 937.82

Abutment Type = 3 Sloping abutments and sloping embankments

Slope of abutments = 2

Top width of embankment = 60

Centroid station of bridge opening =

Wing Wall Type = No wing walls present

Width =

Angle =

Radius =

Guide Banks Type = No Guide Bank present

Length =

Offset =

Angle =

Selected Low Flow Methods = W.S.Pro Method

High Flow Method

Pressure and Weir flow

Submerged Inlet Cd =

Submerged Inlet + Outlet Cd = .8

Max Low Cord =

Additional Bridge Parameters

Add Friction component to Momentum

Do not add Weight component to Momentum

Class B flow critical depth computations use critical depth

inside the bridge at the upstream end

Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Noonday Creek

REACH: 1

RS: 590

INPUT

Description: Downstream SBL

Station	Elevation	Data num=	13
---------	-----------	-----------	----

Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4816	955	4851	950	4886	945	4907	940	4924	938
4973	939.8	4993	928.3	5000	927.2	5006	928.4	5016	936
5051	938	5096	949	5176	965				

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4816 .13 4973 .06 5016 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4973 5016 140 195 235 .3 .5

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4816 4886 960.56 T
 5126 5176 960.62 T

CROSS SECTION

RIVER: Noonday Creek
 REACH: 1 RS: 395

INPUT
 Description: Middle Section - adj elev +0.1
 Station Elevation Data num= 8
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4894 950.1 4953 943.1 4973 939.6 4993 928.1 5000 927
 5006 928.2 5016 935.8 5116 945.1

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4894 .13 4973 .06 5016 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4973 5016 95 150 190 .5 .7

CROSS SECTION

RIVER: Noonday Creek
 REACH: 1 RS: 245

INPUT
 Description: Upstream NBL
 Station Elevation Data num= 14
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4529 950 4629 946 4779 940 4849 935 4919 934
 4979 934 4987 926.7 5000 926.7 5014 927.2 5025 933
 5052 938 5092 941 5147 942 5202 950

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4529 .13 4979 .06 5025 .13

Bank Sta: Left Right Lengths: Left Channel Right Coeff Contr. Expan.
 4979 5025 245 245 245 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4529 4840 957.93 T
 5125 5202 959.44 T

BRIDGE

RIVER: Noonday Creek
 REACH: 1 RS: 100

INPUT
 Description: NB Bridge
 Distance from Upstream XS = 70
 Deck/Roadway Width = 105
 Weir Coefficient = 2.6
 Upstream Deck/Roadway Coordinates
 num= 8
 Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord Sta Hi Cord Lo Cord
 4405 963 4645 960 0 4885 957.93 0
 4885 957.93 954.82 5125 959.44 956.32 5125 959.44 0
 5355 963 0 5585 966.56

Upstream Bridge Cross Section Data

Station Elevation Data num= 14
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev

4529	949.54	4629	945.54	4779	939.54	4849	934.54	4919	933.54
4979	933.54	4987	926.24	5000	926.24	5014	926.74	5025	932.54
5052	937.54	5092	940.54	5147	941.54	5202	949.54		

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4529 .13 4979 .06 5025 .13

Bank Sta: Left Right Coeff Contr. Expan.
 4979 5025 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4529 4840 957.93 T
 5125 5202 959.44 T

Downstream Deck/Roadway Coordinates
 num= 8

Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord	Sta	Hi	Cord	Lo	Cord
4405	963				4645	960	0			4885	957.93		0	
4885	957.93	954.82			5125	959.44	956.32			5125	959.44		0	
5355	963		0		5585	966.56								

Downstream Bridge Cross Section Data

Station Elevation Data num= 11
 Sta Elev Sta Elev Sta Elev Sta Elev Sta Elev
 4701 948.46 4731 937.46 4926 934.46 4986 932.26 4990 927.06
 5000 925.86 5025 929.26 5032 933.96 5087 940.46 5272 945.46
 5417 955.46

Manning's n Values num= 3
 Sta n Val Sta n Val Sta n Val
 4701 .13 4986 .06 5032 .13

Bank Sta: Left Right Coeff Contr. Expan.
 4986 5032 .5 .7

Ineffective Flow num= 2
 Sta L Sta R Elev Permanent
 4701 4885 957.93 T
 5125 5417 959.44 T

Upstream Embankment side slope = 2 horiz. to 1.0 vertical

Downstream Embankment side slope = 2 horiz. to 1.0 vertical

Maximum allowable submergence for weir flow = .98

Elevation at which weir flow begins =

Energy head used in spillway design =

Spillway height used in design =

Weir crest shape = Broad Crested

Number of Abutments = 2

Abutment Data

Upstream	num=	2	
Sta	Elev	Sta	Elev
4885	954.82	4945	924.82
Downstream	num=	2	
Sta	Elev	Sta	Elev
4885	954.82	4945	924.82

Abutment Data

Upstream	num=	2	
Sta	Elev	Sta	Elev
5065	926.32	5125	956.32
Downstream	num=	2	
Sta	Elev	Sta	Elev
5065	926.32	5125	956.32

Number of Piers = 2

Pier Data

Pier Station	Upstream=	4965	Downstream=	4965
Upstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	958	
Downstream	num=	2		
Width	Elev	Width	Elev	
3	0	3	958	

Pier Data
Pier Station Upstream= 5045 Downstream= 5045
Upstream num= 2
Width Elev Width Elev
3 0 3 958
Downstream num= 2
Width Elev Width Elev
3 0 3 958

Number of Bridge Coefficient Sets = 1

Low Flow Methods and Data
W.S. Pro Method

W.S.Pro Data
Left Embankment
El of the top of the embankment = 957.93
El of the toe of the abutment = 933.82
Right Embankment
El of the top of the embankment = 959.44
El of the toe of the abutment = 941.18
Abutment Type = 3 Sloping abutments and sloping embankments
Slope of abutments = 2
Top width of embankment = 60
Centroid station of bridge opening =
Wing Wall Type = No wing walls present
Width =
Angle =
Radius =
Guide Banks Type = No Guide Bank present
Length =
Offset =
Angle =

Selected Low Flow Methods = W.S.Pro Method

High Flow Method
Pressure and Weir flow
Submerged Inlet Cd =
Submerged Inlet + Outlet Cd = .8
Max Low Cord =

Additional Bridge Parameters
Add Friction component to Momentum
Do not add Weight component to Momentum
Class B flow critical depth computations use critical depth
inside the bridge at the upstream end
Criteria to check for pressure flow = Upstream energy grade line

CROSS SECTION

RIVER: Noonday Creek

REACH: 1 RS: 0

INPUT

Description: Downstream NBL

Station	Elevation	Data	num=	11					
Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4701	948	4731	937	4926	934	4986	931.8	4990	926.6
5000	925.4	5025	928.8	5032	933.5	5087	940	5272	945
5417	955								

Manning's n Values	num=	3			
Sta	n Val	Sta	n Val	Sta	n Val
4701	.13	4986	.06	5032	.13

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff Contr.	Expan.
	4986	5032		600	630	650	.5	.7

Ineffective Flow	num=	2	
Sta L	Sta R	Elev	Permanent
4701	4885	957.93	T
5125	5417	959.44	T

CROSS SECTION

RIVER: Noonday Creek
REACH: 1 RS: -630

INPUT

Description: Exit

Station	Elevation	Data	num=	13	Sta	Elev	Sta	Elev	Sta	Elev	Sta	Elev
4802	941.9	4867	941.5	4875	941.8	4923	932	4944	932.7	4944	932.7	
4977	932.7	4981	926.3	5000	925	5020	926	5023	932.6	5023	932.6	
5064	932.4	5092	944.3	5137	945.6							

Manning's n	Values	num=	3	Sta	n Val	Sta	n Val	Sta	n Val
4802	.13	4977	.06	5023	.13				

Bank Sta:	Left	Right	Lengths:	Left	Channel	Right	Coeff	Contr.	Expan.
4977	5023			0	0	0	.1		.3

SUMMARY OF MANNING'S N VALUES

River: Noonday Creek

Reach	River Sta.	n1	n2	n3
1	1250	.13	.06	.13
1	790	.13	.06	.13
1	690	Bridge		
1	590	.13	.06	.13
1	395	.13	.06	.13
1	245	.13	.06	.13
1	100	Bridge		
1	0	.13	.06	.13
1	-630	.13	.06	.13

SUMMARY OF REACH LENGTHS

River: Noonday Creek

Reach	River Sta.	Left	Channel	Right
1	1250	400	460	480
1	790	200	200	200
1	690	Bridge		
1	590	140	195	235
1	395	95	150	190
1	245	245	245	245
1	100	Bridge		
1	0	600	630	650
1	-630	0	0	0

SUMMARY OF CONTRACTION AND EXPANSION COEFFICIENTS

River: Noonday Creek

Reach	River Sta.	Contr.	Expan.
1	1250	.3	.5
1	790	.3	.5
1	690	Bridge	
1	590	.3	.5
1	395	.5	.7
1	245	.5	.7
1	100	Bridge	
1	0	.5	.7
1	-630	.1	.3

Section VI
FEMA Computer Model Output

**DUPLICATE EFFECTIVE (DE) MODEL
FLOODWAY**

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Adj (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	203.92	Natural	893.21		894.29	340.19	3218.68	13578.56	111.75	1947.70	2057.80		
Reach-1	203.92	Floodway	893.21	-0.01	894.29	290.00	3213.37	13564.33	111.31	1790.00	1947.70	2057.80	2080.00
Reach-1	776.77 NEW	Natural	894.66		894.84	839.76	4319.40	6299.09	6290.51	990.80	1057.56		
Reach-1	776.77 NEW	Floodway	894.65	0.00	894.94	590.00	5246.90	7363.54	4298.55	724.00	990.80	1057.56	1314.00
Reach-1	1621.49	Natural	894.97		895.67	928.32	1314.46	7660.29	7934.25		1974.98	2023.08	
Reach-1	1621.49	Floodway	894.96	0.00	896.15	600.00	1635.12	9153.26	6120.61	1800.00	1974.98	2023.08	2400.00
Reach-1	3153.49	Natural	897.84		899.14	441.64	3493.10	12720.85	695.05		1954.50	2041.10	
Reach-1	3153.49	Floodway	898.59	0.75	899.77	330.00	3388.07	12742.21	778.71	1765.00	1954.50	2041.10	2095.00
Reach-1	4576.80	Natural	901.63		902.45	343.98	1204.04	9750.79	5879.17		970.00	1030.00	
Reach-1	4576.80	Floodway	901.92	0.29	902.78	225.00	1216.74	9956.63	5660.64	930.00	970.00	1030.00	1155.00
Reach-1	4753.78	Natural	901.97		903.21	172.13	296.63	16327.63	209.74		938.80	1064.20	
Reach-1	4753.78	Floodway	902.27	0.30	903.50	140.00	180.62	16556.91	96.47	930.00	938.80	1064.20	1070.00
Reach-1	4858.98 BR D	Natural	902.38		903.91	119.40		17271.00			938.80	1064.20	
Reach-1	4858.98 BR D	Floodway	902.69	0.30	904.15	119.40		17271.00		930.00	938.80	1064.20	1070.00
Reach-1	4858.98 BR U	Natural	902.79		904.23	119.40		17271.00			938.80	1064.20	
Reach-1	4858.98 BR U	Floodway	903.06	0.27	904.46	119.40		17271.00		857.80	938.80	1064.20	1145.20
Reach-1	4958.98	Natural	904.22		904.70	287.40	4468.73	9243.17	3559.10		975.00	1040.00	
Reach-1	4958.98	Floodway	904.41	0.19	904.91	287.40	4392.20	9398.81	3480.00	857.80	975.00	1040.00	1145.20
Reach-1	5488.69 NEW	Natural	904.98		905.02	1320.08	5923.16	3122.35	8225.49		934.25	985.00	
Reach-1	5488.69 NEW	Floodway	905.19	0.22	905.32	610.00	5030.40	4548.25	7692.35	700.00	934.25	985.00	1310.00
Reach-1	5940.21	Natural	905.05		905.10	1796.48	7448.19	4232.39	5590.43		1968.00	2043.00	
Reach-1	5940.21	Floodway	905.35	0.30	905.47	736.00	5216.93	5738.93	6315.14	1670.00	1968.00	2043.00	2406.00
Reach-1	7286.45	Natural	905.32		905.59	697.23	4399.64	6463.77	8407.59		1965.50	2023.80	
Reach-1	7286.45	Floodway	905.79	0.47	906.24	460.00	5142.20	7950.74	4178.07	1735.00	1965.50	2023.80	2195.00
Reach-1	8445.73	Natural	906.06		907.26	385.56	2217.95	11359.20	3693.84		1961.40	2026.30	
Reach-1	8445.73	Floodway	906.93	0.87	907.99	290.00	2449.53	11234.63	3586.85	1875.00	1961.40	2026.30	2165.00
Reach-1	9055.09	Natural	907.50		908.46	197.00	3474.21	10285.70	3511.09		972.00	1028.00	
Reach-1	9055.09	Floodway	908.06	0.56	909.02	197.00	3383.22	10540.85	3366.94	903.00	972.00	1028.00	1100.00
Reach-1	9202.15 BR D	Natural	905.98		910.36	50.00		14423.00			972.00	1028.00	
Reach-1	9202.15 BR D	Floodway	906.89	0.71	910.73	50.00		14423.00			972.00	1028.00	1100.00
Reach-1	9202.15 BR U	Natural	907.31		911.08	50.00		14423.00			972.00	1028.00	
Reach-1	9202.15 BR U	Floodway	907.77	0.46	911.36	50.00		14423.00			972.00	1028.00	1090.00

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Adt (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	9298.15	Natural Floodway	911.07		912.11	194.69	3368.99	9355.54	1698.47		980.00	1028.00	
Reach-1	9298.15	Natural Floodway	911.29	0.21	912.33	187.00	3195.78	9451.92	1775.30	903.00	980.00	1028.00	1090.00
Reach-1	10400.82	Natural Floodway	912.93		913.25	468.18	4685.10	6560.65	3177.26		1980.00	2030.00	
Reach-1	10400.82	Natural Floodway	913.12	0.18	913.50	285.00	3925.44	7017.25	3480.31	1865.00	1980.00	2030.00	2150.00
Reach-1	10946.58 NEW	Natural Floodway	912.91		913.91	285.89	2256.55	7443.31	4723.14		291.88	325.08	
Reach-1	10946.58 NEW	Natural Floodway	913.14	0.24	914.18	215.00	1883.86	7561.21	4977.93	235.00	291.88	325.08	450.00
Reach-1	11699.91	Natural Floodway	914.24		914.46	545.28	5486.30	8251.12	685.58		1927.10	2018.10	
Reach-1	11699.91	Natural Floodway	914.49	0.25	914.78	297.00	4474.39	9173.72	774.89	1773.00	1927.10	2018.10	2070.00
Reach-1	12336.76 NEW	Natural Floodway	914.55		914.57	1244.73	7104.38	2702.02	4616.60		1262.92	1321.01	
Reach-1	12336.76 NEW	Natural Floodway	914.88	0.33	915.01	470.00	6797.25	4958.02	2667.73	972.00	1262.92	1321.01	1442.00
Reach-1	13462.07	Natural Floodway	914.66		914.71	813.10	5038.36	2469.30	6915.34		1978.30	2022.20	
Reach-1	13462.07	Natural Floodway	915.22	0.55	915.29	520.00	5100.03	3105.07	6217.90	1780.00	1978.30	2022.20	2280.00
Reach-1	14756.18	Natural Floodway	914.85		914.88	1480.52	5541.58	2073.37	6808.05		1970.20	2021.00	
Reach-1	14756.18	Natural Floodway	915.52	0.67	915.60	680.00	4187.40	3405.07	6830.54	1866.00	1970.20	2021.00	2346.00
Reach-1	16285.42	Natural Floodway	915.13		915.17	1304.41	5255.01	2807.90	6380.09		1965.00	2030.00	
Reach-1	16285.42	Natural Floodway	916.00	0.87	916.04	750.00	4562.77	2833.33	7026.90	1660.00	1965.00	2030.00	2410.00
Reach-1	17413.80	Natural Floodway	915.59		915.63	1897.15	5158.67	2815.72	6448.62		1970.00	2040.00	
Reach-1	17413.80	Natural Floodway	916.49	0.91	916.65	700.00	4553.14	4730.10	5139.76	1855.00	1970.00	2040.00	2355.00
Reach-1	17515.47	Natural Floodway	915.64		915.68	1898.79	5265.64	2827.87	6558.50		1970.00	2040.00	
Reach-1	17515.47	Natural Floodway	916.61	0.97	916.77	700.00	4654.13	4753.21	5244.66	1655.00	1970.00	2040.00	2355.00
Reach-1	17841.44BRD	Natural Floodway	918.15		918.17	1494.10	4430.40	6421.11	3783.50		1949.60	2050.40	
Reach-1	17841.44BRD	Natural Floodway	918.23	0.08	918.90	700.00	4557.76	6911.21	3171.28	1655.00	1949.60	2050.40	2355.00
Reach-1	17841.44BRU	Natural Floodway	918.15		918.17	1494.10	4430.40	6421.11	3783.50		1949.60	2050.40	
Reach-1	17841.44BRU	Natural Floodway	918.69	0.53	918.90	550.00	4832.45	6716.62	3091.18	1648.00	1949.60	2050.40	2198.00
Reach-1	17748.44 NEW	Natural Floodway	918.15		918.17	1802.78	7812.77	1744.54	5094.69		1967.33	2029.17	
Reach-1	17748.44 NEW	Natural Floodway	918.69	0.53	918.90	550.00	6696.83	4609.30	3345.87	1648.00	1967.33	2029.17	2198.00
Reach-1	17813.61	Natural Floodway	918.12		918.28	1252.38	8560.92	4090.99	2000.08		1980.00	2027.00	
Reach-1	17813.61	Natural Floodway	918.72	0.60	919.13	530.00	5765.47	5828.48	3058.05	1654.00	1980.00	2027.00	2184.00
Reach-1	18148.32	Natural Floodway	918.51		918.75	627.74	9171.43	5170.71	309.86		1972.00	2028.00	
Reach-1	18148.32	Natural Floodway	919.45	0.93	919.76	400.00	8280.93	5984.26	386.81	1650.00	1972.00	2028.00	2050.00
Reach-1	18651.90	Natural	919.04		919.70	518.83	2087.53	7117.65	5446.83		1980.00	2030.00	

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)											
Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top With Act	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta R (ft)
Reach-1	18851.90	Floodway	920.05	1.00	920.63	390.00	2867.03	7059.48	4915.49	1795.00	1980.00
Reach-1	20340.54	Natural	922.07	0.79	923.30	769.63	3718.54	4870.16	6063.30	1967.10	2022.10
Reach-1	20340.54	Floodway	922.86			400.00	1949.49	6066.54	6635.97	1895.00	1967.10
Reach-1	20788.78 NEW	Natural	922.69		923.13	516.55	1300.58	5672.85	7678.57	673.37	725.69
Reach-1	20788.78 NEW	Floodway	923.66	0.97	924.13	370.00	1655.37	6096.97	6899.66	600.00	673.37
Reach-1	211440.00	Natural	923.73		923.90	721.73	10105.46	4351.59	194.95	1975.00	2030.00
Reach-1	211440.00	Floodway	924.67	0.94	924.90	437.00	9475.94	4908.56	267.50	1623.00	1975.00
Reach-1	22221.01 NEW	Natural	924.25		924.31	1144.61	5271.26	2911.43	2927.31	988.66	1050.16
Reach-1	22221.01 NEW	Floodway	925.23	0.98	925.30	800.00	6029.48	3133.54	1946.98	500.00	988.66
Reach-1	23217.96	Natural	923.97		926.33	150.66	2488.08	8123.30	498.62	980.00	1020.00
Reach-1	23217.96	Floodway	924.96	1.00	927.13	100.00	2384.77	8226.74	498.49	935.00	980.00
Reach-1	23378.74BR D	Natural	925.64		927.61	120.80	2914.64	8382.44	619.92	980.00	1020.00
Reach-1	23378.74BR D	Floodway	926.44	0.81	928.25	100.00	2894.27	8358.25	664.48	935.00	980.00
Reach-1	23378.74BR U	Natural	926.52		927.92	146.88	2092.56	8777.83	1046.61	980.00	1028.00
Reach-1	23378.74BR U	Floodway	927.31	0.79	928.53	145.78	2136.70	8643.95	1136.35	870.00	980.00
Reach-1	23477.24	Natural	927.63		928.28	227.41	4009.69	6998.17	909.14	980.00	1028.00
Reach-1	23477.24	Floodway	928.10	0.47	928.82	200.00	3533.00	7373.31	1010.69	870.00	980.00
Reach-1	24584.31	Natural	929.08		929.36	361.31	4482.29	7108.54	326.17	557.00	635.19
Reach-1	24584.31	Floodway	929.60	0.52	929.96	260.00	3714.58	7852.94	349.48	400.00	557.00
Reach-1	24776.87 NEW	Natural	929.22		928.52	383.27	2871.79	4521.22	4523.99	641.15	683.91
Reach-1	24776.87 NEW	Floodway	929.86	0.65	930.14	375.00	2982.05	4461.02	4473.93	505.00	641.15
Reach-1	24842.55BR D	Natural	929.13		929.66	342.80	3703.69	5694.58	2518.74	650.00	695.00
Reach-1	24842.55BR D	Floodway	929.79	0.66	930.26	325.00	3674.77	5619.84	2622.39	505.00	650.00
Reach-1	24842.55BR U	Natural	929.25		929.77	343.35	3708.80	5673.81	2534.39	650.00	695.00
Reach-1	24842.55BR U	Floodway	929.90	0.65	930.35	345.43	3731.70	5564.77	2620.52	450.00	650.00
Reach-1	24942.55 NEW	Natural	929.69		928.91	430.00	4004.05	4007.60	3905.35	642.06	683.63
Reach-1	24942.55 NEW	Floodway	930.27	0.58	930.47	430.00	4007.32	4003.00	3906.69	450.00	642.06
Reach-1	26158.34	Natural	930.71		931.03	488.67	1174.78	7847.13	3095.09	1975.20	2077.70
Reach-1	26158.34	Floodway	931.19	0.48	931.54	345.00	1121.40	8004.47	2791.13	1900.00	1975.20
Reach-1	27163.80	Natural	931.75		932.27	577.53	1405.09	5475.63	5036.28	970.00	1020.00
Reach-1	27163.80	Floodway	932.17	0.42	933.02	313.00	1807.49	6637.58	3471.93	862.00	880.00

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S.Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	27924.79	Natural	933.39	0.91	935.22	115.96	11917.00		910.00	910.00	1073.00		
Reach-1	27924.79	Floodway	934.30		935.82	115.90	11917.00		934.40	910.00	1073.00	1050.30	
Reach-1	28138.58BR D	Natural	934.59		936.02	121.53	11917.00		910.00	910.00	1073.00		
Reach-1	28138.58BR D	Floodway	935.11	0.52	936.42	115.90	11917.00		934.40	910.00	1073.00	1050.30	
Reach-1	28138.58BR U	Natural	935.37		936.60	125.16	11917.00		910.00	910.00	1073.00		
Reach-1	28138.58BR U	Floodway	935.77	0.40	936.91	127.02	11917.00		900.00	910.00	1073.00	1075.00	
Reach-1	28275.58	Natural	934.88		937.63	245.39	1913.32	8886.01	1117.68	982.00	1020.00		
Reach-1	28275.58	Floodway	935.26	0.38	937.91	175.00	1785.69	8918.79	1212.52	900.00	982.00	1020.00	1075.00
Reach-1	29014.22	Natural	939.35		940.48	259.80	4644.36	5639.33	1633.31	989.00	1015.00		
Reach-1	29014.22	Floodway	939.46	0.11	940.68	195.00	4330.96	5784.89	1801.16	880.00	989.00	1015.00	1075.00
Reach-1	29865.01	Natural	940.86		940.96	739.58	742.54	4116.67	7057.79	1988.90	2031.70		
Reach-1	29865.01	Floodway	941.11	0.25	941.28	500.00	976.84	5057.29	5883.08	1860.00	1968.90	2031.70	2360.00
Reach-1	30358.55 NEW	Natural	941.05		941.08	859.26	6832.24	2427.05	2657.71	818.99	872.40		
Reach-1	30358.55 NEW	Floodway	941.40	0.35	941.50	416.00	6251.35	3668.71	1996.94	530.00	818.99	872.40	946.00
Reach-1	31128.08	Natural	940.63		942.13	238.13	3825.69	6323.38	1767.93	989.00	1020.00		
Reach-1	31128.08	Floodway	941.29	0.67	942.76	200.00	3558.12	6429.73	1929.15	883.00	989.00	1020.00	1083.00
Reach-1	31244.21BR D	Natural	942.18		942.71	24.60	11917.00		913.00	1133.00			
Reach-1	31244.21BR D	Floodway	942.50	0.32	943.28	0.13	11917.00		883.00	913.00	1133.00	1083.00	
Reach-1	31244.21BR U	Natural	942.59		943.12		11917.00		913.00	1133.00			
Reach-1	31244.21BR U	Floodway	942.82	0.24	944.50		11917.00		945.00	913.00	1133.00	1045.00	
Reach-1	31353.71	Natural	942.10		944.21	151.46	1878.08	8493.62	1545.30	980.00	1018.00		
Reach-1	31353.71	Floodway	943.09	0.98	945.12	100.00	1796.20	8704.25	1416.56	945.00	980.00	1018.00	1045.00
Reach-1	32008.58	Natural	945.83		946.04	262.24	2640.06	4124.20	583.74	980.00	1028.00		
Reach-1	32008.58	Floodway	946.57	0.74	946.77	190.00	2041.28	4113.30	593.42	870.00	980.00	1028.00	1060.00
Reach-1	32395.49BR D	Natural	946.08		946.23	196.97	7348.00			880.00	1121.00		
Reach-1	32395.49BR D	Floodway	946.77	0.70	946.92	166.35	7348.00		870.00	880.00	1121.00	1060.00	
Reach-1	32395.49BR U	Natural	946.10		946.25	197.12	7348.00			880.00	1121.00		
Reach-1	32395.49BR U	Floodway	946.79	0.69	946.94	165.00	7348.00		918.00	880.00	1121.00	1083.00	
Reach-1	32489.49	Natural	945.97		946.46	227.00	1497.60	4692.74	1157.66	985.00	1021.00	1083.00	
Reach-1	32489.49	Floodway	946.69	0.72	947.11	165.00	1553.91	4580.74	1213.34	918.00	985.00	1021.00	
Reach-1	32838.11	Natural	946.16		947.55	124.55	840.46	5524.57	982.97	980.00	1020.00		
Reach-1	32838.11	Floodway	946.85	0.69	948.01	115.00	952.91	5328.87	1068.22	945.00	990.00	1020.00	1060.00

HEC-RAS Plan: FW River: RIVER_1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act. (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	32909.32	Natural	947.77		948.02	184.54		7348.00			891.00	1109.00	
Reach-1	32909.32	Floodway	948.09	0.32	948.40	130.00		7348.00		930.00	891.00	1109.00	1060.00
Reach-1	32976.16BR D	Natural	947.80		948.05	184.77		7348.00			891.00	1109.00	
Reach-1	32976.16BR D	Floodway	948.12	0.32	948.43	130.00		7348.00		930.00	891.00	1109.00	1060.00
Reach-1	32976.16BR U	Natural	947.86		948.11	185.18		7348.00			891.00	1109.00	
Reach-1	32976.16BR U	Floodway	948.15	0.29	948.50	120.00		7348.00		932.00	891.00	1109.00	1052.00
Reach-1	33046.16	Natural	947.90		948.15	185.42		7348.00			891.00	1109.00	
Reach-1	33046.16	Floodway	948.19	0.29	948.54	120.00		7348.00		932.00	891.00	1109.00	1052.00
Reach-1	33155.58	Natural	947.79		948.54	168.41		1924.96	4708.75	714.29		982.00	1015.00
Reach-1	33155.58	Floodway	948.11	0.31	948.95	110.00		1757.29	4947.93	642.79		982.00	1015.00
Reach-1	34068.85	Natural	949.68		950.18	264.51		922.46	4776.00	1649.54		980.00	1020.00
Reach-1	34068.85	Floodway	950.08	0.40	950.67	120.00		813.72	5119.36	1414.92		980.00	1020.00
Reach-1	34164.15	Natural	949.79		950.40	99.00		498.88	7630.60	404.52		967.00	1030.00
Reach-1	34164.15	Floodway	950.23	0.44	950.84	99.00		405.45	7787.36	341.19		967.00	1030.00
Reach-1	34250.29	Culvert											
Reach-1	34319.79	Natural	952.31		952.54	334.79		2953.50	3890.83	1789.67		985.00	1022.00
Reach-1	34319.79	Floodway	952.60	0.29	952.86	223.00		2899.80	4033.80	1600.40		985.00	1022.00
Reach-1	34887.32 NEW	Natural	952.79		952.84	686.41		5599.83	2102.08	832.09		481.60	514.97
Reach-1	34887.32 NEW	Floodway	953.10	0.31	953.25	282.00		4285.83	3000.10	1248.07		481.60	514.97
Reach-1	35731.12	Natural	953.08		953.18	579.96		3787.01	2676.89	2070.10		1971.90	2009.50
Reach-1	35731.12	Floodway	953.60	0.52	953.71	380.00		3742.67	2782.72	2008.61		1740.00	1971.90
Reach-1	36431.22	Natural	953.36		953.42	494.22		2519.54	1996.72	963.74		980.00	1020.00
Reach-1	36431.22	Floodway	953.88	0.52	953.94	320.00		2376.22	2065.72	1038.06		980.00	1020.00
Reach-1	36570.11	Natural	953.39		953.45	543.51		1265.93	3002.29	1211.78		982.00	1044.00
Reach-1	36570.11	Floodway	953.91	0.52	953.98	380.00		1074.64	3173.21	1232.15		982.00	1044.00
Reach-1	36685.49	Culvert											
Reach-1	36721.49	Natural	954.08		954.26	445.67		4637.51	432.92			952.00	1040.00
Reach-1	36721.49	Floodway	954.90	0.82	955.09	180.00		264.25	4881.69	334.06		952.00	1040.00
Reach-1	36788.68	Natural	954.16		954.30	368.80		732.63	1708.44	3054.93		990.00	1012.00
Reach-1	36788.68	Floodway	954.96	0.80	955.13	180.00		935.62	1814.34	2746.04		990.00	1012.00

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	End Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	End Sta R (ft)
Reach-1	37048.78 NEW	Natural	954.27		954.61	168.82	171.40	2031.41	3293.19	153.22	174.49		
Reach-1	37048.78 NEW	Floodway	955.05	0.78	955.43	135.00	205.78	2211.82	3078.40	138.00	153.22	174.49	273.00
Reach-1	37485.78	Natural	954.83		955.29	204.35	979.67	2615.95	1900.38		1992.00	2018.00	
Reach-1	37485.78	Floodway	955.59	0.75	956.13	125.00	1167.41	2857.96	1470.63	1945.00	1992.00	2018.00	2070.00
Reach-1	37684.34 NEW	Natural	955.36		955.60	217.78	628.73	1619.99	3247.28		155.62	172.96	
Reach-1	37684.34 NEW	Floodway	956.17	0.80	956.44	170.00	704.27	1748.87	3042.86	120.00	155.62	172.96	290.00
Reach-1	38162.53	Natural	955.77		955.79	729.36	396.79	812.97	4286.25		1990.00	2016.00	
Reach-1	38162.53	Floodway	956.61	0.83	956.63	470.00	481.75	916.39	4097.87	1930.00	1990.00	2016.00	2400.00
Reach-1	39106.84 NEW	Natural	955.93		956.19	345.09	1422.27	2188.70	1885.03		296.65	329.21	
Reach-1	39106.84 NEW	Floodway	956.74	0.81	957.04	230.00	1642.58	2429.02	1424.41	200.00	296.65	329.21	430.00
Reach-1	39458.28	Natural	955.84		957.47	123.71	1106.66	4016.97	372.37		980.00	1012.00	
Reach-1	39458.28	Floodway	956.77	0.92	958.17	100.00	980.22	4029.60	476.18	945.00	980.00	1012.00	1045.00
Reach-1	39777.89 NEW	Natural	957.97		958.20	176.62	483.47	4783.91	228.62		945.74	1033.93	
Reach-1	39777.89 NEW	Floodway	958.53	0.56	958.80	110.00	56.90	5231.65	207.45	940.00	945.74	1033.93	1050.00
Reach-1	40471.23	Culvert											
Reach-1	41077.23 NEW	Natural	959.93		960.06	184.34	230.28	5239.28	26.44		947.86	1061.88	
Reach-1	41077.23 NEW	Floodway	960.49	0.56	960.63	130.00	38.04	5432.64	25.32	940.00	947.86	1061.88	1070.00
Reach-1	41269.88	Natural	960.03		960.15	527.21	3428.12	1580.99	486.90		923.00	948.00	
Reach-1	41269.88	Floodway	960.56	0.53	960.71	380.00	3191.01	1734.74	570.25	605.00	923.00	948.00	985.00
Reach-1	42211.00	Natural	960.66		960.74	717.49	1073.75	1463.93	2958.32		1982.90	2017.60	
Reach-1	42211.00	Floodway	961.24	0.57	961.34	390.00	1353.47	1647.28	2495.26	1850.00	1982.90	2017.60	2240.00
Reach-1	42778.44	Natural	961.11		961.28	562.48	3435.08	1675.35	385.57		1986.00	2014.00	
Reach-1	42778.44	Floodway	961.59	0.58	962.00	300.00	2836.62	2113.56	545.82	1760.00	1986.00	2014.00	2060.00
Reach-1	43468.18	Natural	962.16		962.26	744.03	3145.22	1138.96	1211.82		1985.00	2009.00	
Reach-1	43468.18	Floodway	963.00	0.85	963.16	400.00	3137.52	1341.76	1016.72	1700.00	1985.00	2009.00	2100.00
Reach-1	44309.28	Natural	963.54		964.26	574.21	690.69	2230.15	1393.17		985.00	1015.00	
Reach-1	44309.28	Floodway	964.31	0.77	965.25	150.00	689.66	2572.49	1051.85	930.00	985.00	1015.00	1080.00
Reach-1	44438.54 NEW	Natural	965.10		966.82	184.00	587.05	2585.15	1559.80		994.06	1016.95	1091.00
Reach-1	44438.54 NEW	Floodway	965.10	-0.01	966.86	184.00	585.23	2613.29	1533.47	907.00	994.06	1016.95	
Reach-1	44531.77BR D	Natural	969.82		969.84	203.87	22.15	4704.32	7.65		969.00	1032.00	
Reach-1	44531.77BR D	Floodway	969.81	-0.02	969.83	179.98	19.35	4708.46	5.58	907.00	969.00	1032.00	1091.00

HEC-RAS Plan: FW River: RIVER_1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Enc Sta R (ft)	Ch Sta R (ft)
Reach-1	44631.77BR U	Natural	969.82		969.84	203.87	22.15	4704.32	7.65	969.00	1032.00	969.00	1032.00
Reach-1	44631.77BR U	Floodway	969.81	-0.02	969.83	189.63	18.63	4709.17	5.58	670.00	969.00	1032.00	1280.00
Reach-1	44631.27 NEW	Natural	969.82		969.83	686.58	1826.62	959.94	1945.44	978.99	1021.09	978.99	1021.09
Reach-1	44631.27 NEW	Floodway	969.81	-0.02	969.82	610.00	1777.19	1026.10	1928.71	670.00	978.99	1021.09	1280.00
Reach-1	44700.35	Natural	969.83		969.86	660.01	1682.00	1023.88	2026.13	985.00	1015.00	985.00	1015.00
Reach-1	44700.35	Floodway	969.81	-0.01	969.85	580.00	1746.67	1012.59	1972.74	700.00	985.00	1015.00	1280.00
Reach-1	45408.89	Natural	969.95		969.96	720.94	1950.43	727.78	87.79	977.00	1019.00	977.00	1019.00
Reach-1	45408.89	Floodway	969.93	-0.02	969.95	608.00	1969.11	730.12	66.77	430.00	977.00	1019.00	1038.00
Reach-1	45689.70 NEW	Natural	969.91		970.14	121.00	914.21	725.59	1126.20	1939.00	1995.75	2005.59	2005.59
Reach-1	45689.70 NEW	Floodway	969.89	-0.02	970.13	121.00	915.76	756.08	1094.16	1939.00	1995.75	2005.59	2060.00
Reach-1	45777 BR D	Natural	967.40		970.14		0.62	2764.77	0.61	1939.00	1978.50	2021.50	2021.50
Reach-1	45777 BR D	Floodway	967.40	0.00	970.13		0.62	2764.77	0.61	1939.00	1978.50	2021.50	2060.00
Reach-1	45777 BR U	Natural	967.40		971.33	40.00		2766.00		1935.00	1978.50	2021.50	2060.00
Reach-1	45777 BR U	Floodway	967.40	0.00	971.31	40.00		2766.00		1935.00	1978.50	2021.50	2060.00
Reach-1	45868.71 NEW	Natural	971.06		971.34	121.00	724.16	1309.36	732.49	1939.00	1978.50	2021.50	2060.00
Reach-1	45868.71 NEW	Floodway	971.02	-0.04	971.32	121.00	738.00	1338.47	689.54	1935.00	1978.50	2021.50	2060.00
Reach-1	46058.02	Natural	971.43		971.43	1274.48	1833.52	356.53	575.95	1005.50	1040.36	1005.50	1040.36
Reach-1	46058.02	Floodway	971.45	0.02	971.50	300.00	970.51	1018.65	776.85	853.00	1005.50	1040.36	1153.00
Reach-1	46186.37	Natural	971.36		971.49	425.37	1588.00	1008.56	479.44	397.11	425.64	397.11	425.64
Reach-1	46186.37	Floodway	971.45	0.09	971.62	240.00	1609.49	1128.45	338.06	240.00	397.11	425.64	480.00
Reach-1	46508.26	Natural	971.75		972.38	262.25	249.82	2408.10	418.08	980.00	1020.00	980.00	1020.00
Reach-1	46508.26	Floodway	971.92	0.18	972.52	170.00	286.02	2395.47	394.52	909.00	980.00	1020.00	1079.00
Reach-1	46728.27BR D	Natural	973.27		973.81	229.70	1810.76	597.55	665.29	992.00	1009.00	992.00	1009.00
Reach-1	46728.27BR D	Floodway	973.43	0.15	974.46	170.00	1531.91	455.53	1089.22	909.00	992.00	1009.00	1079.00
Reach-1	46728.27BR U	Natural	973.32		973.81	228.22	1799.10	612.18	662.32	992.00	1009.00	992.00	1009.00
Reach-1	46728.27BR U	Floodway	974.13	0.81	974.54	130.00	1528.69	441.65	1106.32	925.00	992.00	1009.00	1055.00
Reach-1	46822.27	Natural	973.32		973.81	228.26	688.97	2124.28	262.75	988.00	1022.00	988.00	1022.00
Reach-1	46822.27	Floodway	974.13	0.81	974.54	130.00	680.81	2091.52	303.67	925.00	988.00	1022.00	1055.00
Reach-1	47875.87	Natural	975.77		976.56	292.45	1126.82	1715.95	233.23	990.00	1010.00	990.00	1010.00
Reach-1	47875.87	Floodway	976.05	0.27	976.86	130.00	1068.24	1748.57	259.19	900.00	990.00	1010.00	1030.00
Reach-1	47926.60BR D	Natural	976.05		976.58	366.30	2614.09	103.64		992.00	1009.00	992.00	1009.00
Reach-1	47926.60BR D	Floodway	976.39	0.54	976.92	130.00	2538.80	376.61	98.81	900.00	992.00	1009.00	1030.00

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdt Adj (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	47926.00BR U	Natural	976.17		976.58	410.12	2701.04	173.10	102.71	992.00	1009.00		
Reach-1	47926.60BR U	Floodway	976.59	0.43	976.92	218.59	2887.81	240.92	85.49	820.00	992.00	1009.00	1080.00
Reach-1	48121.10	Natural	976.17		976.58		376.93	760.73	2084.78	230.49		980.00	1020.00
Reach-1	48121.10	Floodway	976.59	0.43	976.92	280.00	842.81	1973.68	259.51	820.00	980.00	1020.00	1080.00
Reach-1	48220.77	Natural	976.39		977.10	175.86	548.66	2301.98	225.37		980.00	1020.00	
Reach-1	48220.77	Floodway	976.75	0.36	977.35	167.00	578.01	2232.91	265.08	899.00	980.00	1020.00	1066.00
Reach-1	48358.25BR D	Natural	975.74		979.03	32.00		3076.00			980.00	1020.00	
Reach-1	48358.25BR D	Floodway	975.78	0.05	979.03	32.00		3076.00	899.00	980.00	1020.00	1066.00	
Reach-1	48358.25BR U	Natural	980.41		981.40	38.00		3076.00		980.00	1026.00		
Reach-1	48358.25BR U	Floodway	980.39	-0.02	981.38	38.00		3076.00	899.00	980.00	1026.00	1107.00	
Reach-1	48524.75	Natural	981.67		981.74	208.00	805.63	1449.88	820.49		980.00	1026.00	
Reach-1	48524.75	Floodway	981.65	-0.02	981.72	208.00	783.00	1500.03	792.97	899.00	980.00	1026.00	1107.00
Reach-1	48778.94	Natural	981.78		981.80	519.75	810.70	1060.55	1204.75		980.00	1026.00	
Reach-1	48778.94	Floodway	981.74	-0.03	981.80	250.00	690.01	1360.67	1025.32	900.00	980.00	1026.00	1150.00
Reach-1	49005.34 NEW	Natural	981.81		981.85	396.63	69.67	852.29	1512.03		986.57	1016.40	
Reach-1	49005.34 NEW	Floodway	981.81	-0.01	981.86	233.00	85.51	984.96	1363.53	987.00	986.57	1016.40	1200.00
Reach-1	49069	Culvert									980.00	1026.00	
Reach-1	49133.73 NEW	Natural	982.36		982.39	368.50	53.21	1268.27	1112.53		980.14	1037.69	
Reach-1	49133.73 NEW	Floodway	982.40	0.05	982.46	185.00	25.99	1557.13	850.87	974.00	980.14	1037.69	1159.00
Reach-1	49234.85	Natural	982.37		982.40	344.69	146.15	912.85	1375.00		980.00	1020.00	
Reach-1	49234.85	Floodway	982.42	0.05	982.48	195.00	166.33	1155.47	1112.20	945.00	980.00	1020.00	1140.00
Reach-1	49847.50 NEW	Natural	982.52		982.59	260.52	285.74	514.03	1634.23		278.08	294.74	
Reach-1	49847.50 NEW	Floodway	982.65	0.13	982.72	220.00	299.83	522.37	1611.79	230.00	278.08	294.74	450.00
Reach-1	50185.30	Natural	982.79		982.89	338.68	747.39	974.57	712.05		374.16	407.90	
Reach-1	50185.30	Floodway	982.91	0.13	983.10	200.00	382.53	1199.03	852.43	331.00	374.16	407.90	531.00
Reach-1	51158.38 AD	Natural	984.42		985.02	305.21	518.39	1883.87	3174		745.43	789.74	
Reach-1	51158.38 AD	Floodway	985.06	0.64	985.67	116.00	369.84	2011.25	52.92	688.00	745.43	789.74	804.00
Reach-1	51636.06 NEW	Natural	986.76		987.15	276.19	603.57	1771.70	58.73		329.93	377.67	
Reach-1	51636.06 NEW	Floodway	987.15	0.39	987.61	150.00	413.92	1945.38	74.70	245.00	329.93	377.67	395.00
Reach-1	52150.00	Natural	989.12		989.94	226.72	1040.75	1266.31	126.94		1984.00	2008.00	
Reach-1	52150.00	Floodway	989.41	0.29	990.43	150.00	836.77	1413.18	184.05	1900.00	1984.00	2008.00	2050.00

HEC-RAS Plan FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)
Reach-1	53057.03	Natural	993.30		993.51	359.83	439.57	1181.86	812.57		985.00	1020.00
Reach-1	53057.03	Floodway	993.83	0.54	994.11	150.00	409.71	1359.83	684.46	940.00	985.00	1020.00
Reach-1	53008.67	Natural	994.86		994.95	286.32	93.11	488.66	165.24		979.00	1020.00
Reach-1	53008.67	Floodway	995.48	0.62	995.65	60.00	30.94	673.56	42.50	970.00	979.00	1020.00
Reach-1	54001.22 NEW	Natural	997.28		998.40	67.00	29.35	652.27	65.38		991.57	1008.72
Reach-1	54001.22 NEW	Floodway	997.29	0.00	998.41	67.00	29.48	653.91	63.60	966.00	991.57	1008.72
Reach-1	54194.68	Culvert										
Reach-1	54469.68 AF	Natural	1014.62		1014.63	67.00	66.20	603.92	76.88		977.57	1019.12
Reach-1	54469.68 AF	Floodway	1014.62	0.00	1014.63	67.00	40.19	656.48	50.33	966.00	977.57	1019.12
Reach-1	54818.60	Natural	1014.63		1014.63	489.84	835.88	707.88	917.24		1980.00	2020.00
Reach-1	54818.60	Floodway	1014.63	0.00	1014.63	360.00	834.91	718.28	907.81	1835.00	1980.00	2020.00
Reach-1	54941.18	Culvert										
Reach-1	55057.68	Natural	1014.66		1014.66	837.95	1295.49	266.37	898.14		1990.00	2010.00
Reach-1	55057.68	Floodway	1014.64	-0.02	1014.65	240.00	695.13	498.91	1266.95	1914.00	1990.00	2010.00
Reach-1	55098.61	Natural	1014.66		1014.66	800.81	1233.71	620.67	806.61		1977.10	2026.90
Reach-1	55098.61	Floodway	1014.64	-0.02	1014.66	160.00	598.12	1302.86	580.02	1920.00	1977.10	2026.90
Reach-1	55342.61	Natural	1014.66		1014.67	766.09	1148.86	690.22	621.92		1977.10	2026.90
Reach-1	55342.61	Floodway	1014.67	0.01	1014.68	260.00	767.29	955.27	738.44	1872.00	1977.10	2026.90
Reach-1	55522.33	Culvert										
Reach-1	55868.33	Natural	1014.67		1014.68	755.26	1148.21	565.12	747.67		1977.10	2011.70
Reach-1	55868.33	Floodway	1014.69	0.02	1014.70	319.00	1034.17	672.46	754.37	1805.00	1977.10	2011.70
Reach-1	55788.73	Natural	1014.68		1014.70	317.78	1161.60	1241.44	57.96		1972.00	2028.00
Reach-1	55788.73	Floodway	1014.70	0.02	1014.72	220.00	1106.99	1292.90	61.11	1828.00	1972.00	2028.00
Reach-1	56569.00 NEW	Natural	1014.77		1014.93	122.66	729.53	1496.94	234.52		438.96	473.32
Reach-1	56569.00 NEW	Floodway	1014.80	0.03	1014.96	120.00	687.41	1525.89	247.71	390.00	438.96	473.32
Reach-1	56629.59	Culvert										
Reach-1	56726.59 NEW	Natural	1018.40		1018.42	409.63	1172.71	889.39	398.90		436.30	474.36
Reach-1	56726.59 NEW	Floodway	1018.86	0.46	1018.95	115.00	610.89	1550.69	299.42	390.00	436.30	474.36
Reach-1	56849.09	Natural	1018.43		1018.44	477.11	1853.95	425.99	181.06		1980.00	2010.00
Reach-1	56849.09	Floodway	1018.98	0.56	1019.00	310.00	1786.59	458.73	215.69	1756.00	1980.00	2010.00

HEC-RAS Plan: FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Adj (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	57643.30	Natural	1018.69		1018.82	378.92	1002.39	952.83	505.78		1986.00	2011.00	
Reach-1	57643.30	Floodway	1019.22	0.53	1019.39	150.00	959.81	1061.93	439.26	1910.00	1986.00	2011.00	2060.00
Reach-1	57834.78	Natural	1019.18		1019.57	375.44	420.60	1505.29	535.10		980.00	1020.00	
Reach-1	57834.78	Floodway	1019.71	0.53	1020.10	130.00	392.05	1588.62	500.33	935.00	980.00	1020.00	1065.00
Reach-1	58269.38 NEW	Natural	1020.84		1021.71	92.49	237.00	2136.26	87.75		990.16	1024.66	
Reach-1	58269.38 NEW	Floodway	1020.98	0.35	1021.91	85.00	255.33	2100.13	105.54	951.00	990.16	1024.66	1036.00
Reach-1	58351.73BR D	Natural	1022.98		1023.15	347.91	645.19	1315.79	489.85		990.00	1013.00	
Reach-1	58351.73BR D	Floodway	1023.41	0.42	1023.92	85.00	424.25	1657.44	376.89	951.00	990.00	1013.00	1036.00
Reach-1	58351.73BR U	Natural	1022.98		1023.15	376.66	631.27	1315.89	513.67		990.00	1013.00	
Reach-1	58351.73BR U	Floodway	1023.41	0.42	1023.92	101.00	413.85	1618.96	425.78	951.00	990.00	1013.00	1052.00
Reach-1	58415.23	Natural	1022.98		1023.15	418.54	918.72	985.51	556.77		993.10	1012.70	
Reach-1	58415.23	Floodway	1023.41	0.42	1023.92	101.00	514.43	1489.17	457.41	951.00	993.10	1012.70	1052.00
Reach-1	58519.71	Natural	1023.03		1023.90	142.20	376.76	1422.36	661.88		294.42	311.84	
Reach-1	58519.71	Floodway	1023.88	0.85	1024.50	100.00	426.10	1332.89	702.01	260.00	294.42	311.84	360.00
Reach-1	58683.98 NEW	Natural	1025.03		1025.36	273.78	632.02	677.16	1151.82		363.74	373.51	
Reach-1	58683.98 NEW	Floodway	1025.18	0.15	1026.02	100.00	635.25	946.14	879.61	330.00	363.74	373.51	430.00

**CORRECTED EFFECTIVE (CE) –
EXISTING CONDITIONS MODEL
FLOODWAY**

HEC-RAS Plan: CE FW River, RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	203.92	Natural	893.21		894.29	340.19	3218.68	13578.56	111.75	1947.70	2057.80		
Reach-1	203.92	Floodway	893.21	-0.01	894.29	290.00	3213.37	13584.33	111.31	1790.00	1947.70	2057.80	2080.00
Reach-1	776.77 NEW	Natural	894.66		894.84	839.76	4319.40	6290.52		990.80	1057.56		
Reach-1	776.77 NEW	Floodway	894.65	0.00	894.94	590.00	5246.90	7363.54	4298.55	724.00	990.80	1057.56	1314.00
Reach-1	1621.49	Natural	894.97		895.67	928.32	1314.46	7660.29	7934.25		1974.98	2023.08	
Reach-1	1621.49	Floodway	894.96	0.00	896.15	600.00	1635.12	9153.26	6120.61	1800.00	1974.98	2023.08	2400.00
Reach-1	3153.49	Natural	897.84		899.14	441.64	3493.10	12720.85	695.05		1954.50	2041.10	
Reach-1	3153.49	Floodway	898.59	0.75	899.77	330.00	3388.07	12742.21	778.71	1765.00	1954.50	2041.10	2095.00
Reach-1	4576.80	Natural	901.63		902.45	343.98	1204.04	9750.79	5879.17		970.00	1030.00	
Reach-1	4576.80	Floodway	901.92	0.29	902.78	225.00	1216.74	9956.63	5680.64	930.00	970.00	1030.00	1155.00
Reach-1	4753.78	Natural	901.97		903.21	172.13	296.63	16327.63	209.74		938.80	1064.20	
Reach-1	4753.78	Floodway	902.27	0.30	903.50	140.00	180.62	16556.91	96.47	930.00	938.80	1064.20	1070.00
Reach-1	4858.98 BR D	Natural	902.38		903.91	119.40		17271.00			938.80	1064.20	
Reach-1	4858.98 BR D	Floodway	902.69	0.30	904.15	119.40		17271.00		930.00	938.80	1064.20	1070.00
Reach-1	4858.98 BR U	Natural	902.79		904.23	119.40		17271.00			938.80	1064.20	
Reach-1	4858.98 BR U	Floodway	903.06	0.27	904.46	119.40		17271.00		857.80	938.80	1064.20	1145.20
Reach-1	4858.98	Natural	904.22		904.70	287.40	4468.73	9243.17	3559.10		975.00	1040.00	
Reach-1	4858.98	Floodway	904.41	0.19	904.91	287.40	4392.20	9398.81	3480.00	857.80	975.00	1040.00	1145.20
Reach-1	5486.69 NEW	Natural	904.98		905.02	1320.08	5923.16	3122.35	8225.49		934.25	985.00	
Reach-1	5486.69 NEW	Floodway	905.19	0.22	905.32	610.00	5030.40	4548.25	7892.35	700.00	934.25	985.00	1310.00
Reach-1	5940.21	Natural	905.05		905.10	1796.48	7448.19	4232.39	5590.43		1968.00	2043.00	
Reach-1	5940.21	Floodway	905.35	0.30	905.47	736.00	5216.93	5738.93	6315.14	1870.00	1968.00	2043.00	2406.00
Reach-1	7286.45	Natural	905.32		905.59	697.23	4399.64	6463.77	6407.59		1965.50	2023.80	
Reach-1	7286.45	Floodway	905.79	0.47	906.24	460.00	5142.20	7950.74	4178.07	1735.00	1965.50	2023.80	2195.00
Reach-1	8445.73	Natural	906.06		907.26	385.56	2217.95	11359.20	3693.84		1961.40	2026.30	
Reach-1	8445.73	Floodway	906.93	0.87	907.99	290.00	2449.53	11234.63	3586.85	1875.00	1961.40	2026.30	2165.00
Reach-1	9055.09	Natural	907.50		908.46	197.00	3474.21	10285.70	3511.09		972.00	1028.00	
Reach-1	9055.09	Floodway	908.06	0.56	909.02	197.00	3363.22	10540.85	3396.94	903.00	972.00	1028.00	1100.00
Reach-1	9202.15 BR D	Natural	905.98		910.36	50.00	14423.00			903.00	972.00	1028.00	1100.00
Reach-1	9202.15 BR D	Floodway	906.69	0.71	910.73	50.00	14423.00						
Reach-1	9202.15 BR U	Natural	907.31		911.08	50.00	14423.00			903.00	972.00	1028.00	
Reach-1	9202.15 BR U	Floodway	907.77	0.46	911.36	50.00	14423.00			903.00	972.00	1028.00	1090.00

HEC-RAS Plan:CE FW River: RIVER-1 Reach:Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	9298.15	Natural	911.07		912.11	194.69	3368.99	9355.54	1668.47	980.00	1028.00		
Reach-1	9298.15	Floodway	911.29	0.21	912.33	187.00	3195.78	9451.92	1775.30	903.00	980.00	1028.00	1090.00
Reach-1	10400.82	Natural	912.93		913.25	466.18	4685.10	8560.65	3177.26	1980.00	2030.00		
Reach-1	10400.82	Floodway	913.12	0.18	913.50	285.00	3825.44	7017.25	3480.31	1865.00	1980.00	2030.00	2150.00
Reach-1	10946.58 NEW	Natural	912.91		913.91	285.89	2256.55	7443.31	4723.14	291.88	325.08		
Reach-1	10946.58 NEW	Floodway	913.14	0.24	914.18	215.00	1883.86	7561.21	4977.93	235.00	291.88	325.08	450.00
Reach-1	11689.91	Natural	914.24		914.46	545.28	5486.30	8251.12	685.58	1927.10	2018.10		
Reach-1	11689.91	Floodway	914.48	0.25	914.78	297.00	4474.39	9173.72	774.89	1773.00	1927.10	2018.10	2070.00
Reach-1	12336.76 NEW	Natural	914.55		914.57	1244.73	7104.38	2702.02	4616.60	1262.92	1321.01		
Reach-1	12336.76 NEW	Floodway	914.88	0.33	915.01	470.00	6797.25	4958.02	2667.73	972.00	1262.92	1321.01	1442.00
Reach-1	13462.07	Natural	914.66		914.71	813.10	5038.36	2469.30	6915.34	1978.30	2022.20		
Reach-1	13462.07	Floodway	915.22	0.55	915.29	520.00	5100.03	3105.07	6217.90	1780.00	1978.30	2022.20	2280.00
Reach-1	14758.18	Natural	914.85		914.88	1480.52	5541.58	2073.37	6808.05	1970.20	2021.00		
Reach-1	14758.18	Floodway	915.52	0.67	915.60	680.00	4187.40	3405.07	6830.54	1666.00	1970.20	2021.00	2346.00
Reach-1	16285.42	Natural	915.13		915.17	1304.41	5255.01	2807.90	6360.09	1865.00	2030.00		
Reach-1	16285.42	Floodway	916.00	0.87	916.04	750.00	4562.77	2833.33	7026.90	1660.00	1965.00	2030.00	2410.00
Reach-1	17413.80	Natural	915.59		915.63	1897.15	5158.67	2815.72	6448.62	1970.00	2040.00		
Reach-1	17413.80	Floodway	916.49	0.91	916.65	700.00	4553.14	4730.10	5139.76	1655.00	1970.00	2040.00	2355.00
Reach-1	17515.47	Natural	915.64		915.68	1898.79	5265.64	2827.87	6558.50	1970.00	2040.00		
Reach-1	17515.47	Floodway	916.61	0.97	916.77	700.00	4654.13	4753.21	5244.66	1655.00	1970.00	2040.00	2355.00
Reach-1	17841.44BR D	Natural	918.15		918.17	1494.10	3222.62	8710.82	2701.57	1949.60	2050.40		
Reach-1	17841.44BR D	Floodway	918.23	0.08	918.90	700.00	3524.67	8922.10	2193.49	1655.00	1949.60	2050.40	2355.00
Reach-1	17748.44 NEW	Natural	918.15		918.17	1802.78	7812.77	1744.54	5094.69	1967.33	2029.17		
Reach-1	17748.44 NEW	Floodway	918.69	0.53	918.90	550.00	6696.83	4609.30	3345.87	1648.00	1967.33	2029.17	2198.00
Reach-1	17813.61	Natural	918.12		918.28	1252.38	8560.92	4090.99	2000.08	1980.00	2027.00		
Reach-1	17813.61	Floodway	918.72	0.60	919.13	530.00	5765.47	5828.48	3058.05	1654.00	1980.00	2027.00	2184.00
Reach-1	18146.32	Natural	918.51		918.75	627.74	9171.43	5170.71	309.86	1972.00	2028.00		
Reach-1	18146.32	Floodway	919.45	0.93	919.76	400.00	8280.93	5984.26	386.81	1650.00	1972.00	2028.00	2050.00
Reach-1	18651.90	Natural	919.04		919.70	518.83	2087.53	7117.65	5446.83	1980.00	2030.00		

HEC-RAS Plan: OE FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	18651.90	Floodway	920.05	1.00	920.63	390.00	2867.03	7089.48	4915.49	1795.00	1980.00	2030.00	2185.00
Reach-1	20340.54	Natural	922.07		922.33	769.63	3718.54	4870.16	6063.30		1967.10	2022.10	
Reach-1	20340.54	Floodway	922.86	0.79	923.30	400.00	1949.49	6066.54	6635.97	1895.00	1967.10	2022.10	2295.00
Reach-1	20788.78 NEW	Natural	922.69		923.13	516.55	1300.58	5672.85	7678.57		673.37	725.69	
Reach-1	20788.78 NEW	Floodway	923.66	0.97	924.13	370.00	1655.37	6086.97	6889.66	600.00	673.37	725.69	970.00
Reach-1	21440.00	Natural	923.73		923.90	721.73	10105.46	4351.59	194.95		1975.00	2030.00	
Reach-1	21440.00	Floodway	924.67	0.94	924.90	437.00	9475.94	4908.56	287.50	1623.00	1975.00	2030.00	2060.00
Reach-1	22221.01 NEW	Natural	924.25		924.31	1144.61	5271.26	2911.43	2927.31		988.66	1050.16	
Reach-1	22221.01 NEW	Floodway	925.23	0.98	925.30	800.00	6029.48	3133.54	1946.98	500.00	988.66	1050.16	1300.00
Reach-1	23217.96	Natural	923.97		926.33	150.66	2488.08	8123.30	498.62		980.00	1020.00	
Reach-1	23217.96	Floodway	924.96	1.00	927.13	100.00	2384.77	8226.74	498.49	935.00	980.00	1020.00	1035.00
Reach-1	23378.74BR D	Natural	925.64		927.61	120.60	2914.64	8382.44	619.92		980.00	1020.00	
Reach-1	23378.74BR D	Floodway	926.44	0.81	928.25	100.00	2894.27	8358.25	664.48	985.00	980.00	1020.00	1035.00
Reach-1	23378.74BR U	Natural	926.52		927.92	146.88	2092.56	8777.83	1046.61		980.00	1028.00	
Reach-1	23378.74BR U	Floodway	927.31	0.79	928.53	145.78	2136.70	8643.95	1136.35	870.00	980.00	1028.00	1070.00
Reach-1	23477.24	Natural	927.63		928.28	227.41	4009.69	6998.17	909.14		980.00	1028.00	
Reach-1	23477.24	Floodway	928.10	0.47	928.82	200.00	3533.00	7373.31	1010.69	870.00	980.00	1028.00	1070.00
Reach-1	24564.31	Natural	929.08		929.36	361.31	4482.29	7108.54	326.17		557.00	635.19	
Reach-1	24564.31	Floodway	929.60	0.52	929.96	280.00	3714.58	7852.94	349.48	400.00	557.00	635.19	660.00
Reach-1	24778.87 NEW	Natural	929.22		929.52	383.27	2871.79	4521.22	4523.99		641.15	683.91	
Reach-1	24778.87 NEW	Floodway	929.86	0.65	930.14	375.00	2982.05	4461.02	4473.93	505.00	641.15	683.91	880.00
Reach-1	24842.55BR D	Natural	929.13		929.66	342.80	3703.69	5694.58	2518.74		650.00	695.00	
Reach-1	24842.55BR D	Floodway	929.79	0.68	930.26	325.00	3674.77	5619.84	2622.39	505.00	650.00	695.00	880.00
Reach-1	24842.55BR U	Natural	929.25		929.77	343.35	3708.80	5673.81	2534.39		650.00	695.00	
Reach-1	24842.55BR U	Floodway	929.90	0.65	930.35	345.43	3731.70	5564.77	2620.52	450.00	650.00	695.00	880.00
Reach-1	24942.55 NEW	Natural	929.69		929.91	430.00	4004.05	4007.60	3905.35		642.06	683.63	
Reach-1	24942.55 NEW	Floodway	930.27	0.58	930.47	430.00	4007.32	4003.00	3906.69	450.00	642.06	683.63	880.00
Reach-1	26158.34	Natural	930.71		931.03	488.67	1174.78	7847.13	3095.09		1975.20	2077.70	
Reach-1	26158.34	Floodway	931.19	0.48	931.54	345.00	1121.40	8004.47	2791.13	1900.00	1975.20	2077.70	2245.00
Reach-1	27163.80	Natural	931.75		932.27	577.53	1405.09	5475.63	5036.28		970.00	1020.00	
Reach-1	27163.80	Floodway	932.17	0.42	933.02	313.00	1807.49	6637.58	3471.93	862.00	970.00	1020.00	1175.00

HEC-RAS Plan: CE FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Adj (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	27924.79	Natural	933.39		935.22	115.96	11917.00			910.00	1073.00		
Reach-1	27924.79	Floodway	934.30	0.91	935.82	115.90				934.40	910.00	1073.00	1050.30
Reach-1	28138.58BR D	Natural	934.59		936.02	121.53		11917.00			910.00	1073.00	
Reach-1	28138.58BR D	Floodway	935.11	0.52	936.42	115.90		11917.00			934.40	910.00	1073.00
Reach-1	28138.58BR U	Natural	935.37		936.60	125.16		11917.00			910.00	1073.00	
Reach-1	28138.58BR U	Floodway	935.77	0.40	936.91	127.02		11917.00			900.00	910.00	1073.00
Reach-1	28275.58	Natural	934.88		937.63	245.39	8886.01	1117.68		982.00	1020.00		
Reach-1	28275.58	Floodway	935.26	0.38	937.91	175.00	1785.69	8918.79	1212.52	900.00	982.00	1020.00	1075.00
Reach-1	28014.22	Natural	939.35		940.48	259.80	4844.36	1633.31		989.00	1015.00		
Reach-1	28014.22	Floodway	939.46	0.11	940.68	195.00	4330.96	5784.89	1801.16	880.00	989.00	1015.00	1075.00
Reach-1	29855.01	Natural	940.86		940.96	739.58	742.54	4116.67	7057.79		1968.90	2031.70	
Reach-1	29855.01	Floodway	941.11	0.25	941.28	500.00	976.64	5057.29	5883.08	1860.00	1968.90	2031.70	2360.00
Reach-1	30358.55 NEW	Natural	941.05		941.08	859.26	6832.24	2427.05	2657.71		818.99	872.40	
Reach-1	30358.55 NEW	Floodway	941.40	0.35	941.50	416.00	6251.35	3668.71	1996.94	530.00	818.99	872.40	946.00
Reach-1	31128.08	Natural	940.63		942.13	238.13	3825.69	6323.38	1767.93		989.00	1020.00	
Reach-1	31128.08	Floodway	941.29	0.67	942.76	200.00	3558.12	6429.73	1929.15	883.00	989.00	1020.00	1083.00
Reach-1	31244.21BR D	Natural	942.18		942.71	24.60		11917.00			913.00	1133.00	
Reach-1	31244.21BR D	Floodway	942.50	0.32	943.28	0.13		11917.00			883.00	913.00	1133.00
Reach-1	31244.21BR U	Natural	942.59		943.12			11917.00			913.00	1133.00	
Reach-1	31244.21BR U	Floodway	942.82	0.24	944.50			11917.00			945.00	913.00	1133.00
Reach-1	31353.71	Natural	942.10		944.21	151.46	1878.08	8493.62	1545.30		980.00	1018.00	
Reach-1	31353.71	Floodway	943.09	0.98	945.12	100.00	1796.20	8704.25	1416.56	945.00	980.00	1018.00	1045.00
Reach-1	32008.58	Natural	945.83		946.04	262.24	2864.05	4124.21	583.74		980.00	1028.00	
Reach-1	32008.58	Floodway	946.57	0.74	946.77	190.00	2641.28	4113.30	593.42	870.00	980.00	1028.00	1060.00
Reach-1	32395.49BR D	Natural	946.10		946.26	191.14		7348.00			880.00	1121.00	
Reach-1	32395.49BR D	Floodway	946.80	0.70	946.96	160.40		7348.00			880.00	1121.00	1060.00
Reach-1	32395.49BR U	Natural	946.14		946.30	191.35		7348.00			880.00	1121.00	
Reach-1	32395.49BR U	Floodway	946.83	0.69	946.99	159.00		7348.00			880.00	1121.00	1063.00
Reach-1	32469.49	Natural	946.02		946.51	227.87	1499.01	4635.29	1163.70		985.00	1021.00	
Reach-1	32469.49	Floodway	946.74	0.71	947.16	165.00	1556.80	4574.74	1216.46	918.00	985.00	1021.00	1083.00
Reach-1	32836.11	Natural	946.21		947.58	125.06	844.75	5515.13	998.12		980.00	1020.00	
Reach-1	32836.11	Floodway	946.90	0.69	948.05	115.00	958.47	5318.76	1070.78	945.00	980.00	1020.00	1060.00

HEC-RAS Plan: CE FW River: RIVER.1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act. (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	32909.32	Natural	947.80		948.05	184.75		7348.00		891.00	891.00	1109.00	
Reach-1	32909.32	Floodway	948.12	0.32	948.43	130.00		7348.00		930.00	891.00	1109.00	1060.00
Reach-1	32978.16BR D	Natural	947.83		948.10	178.94		7348.00		891.00	891.00	1109.00	
Reach-1	32978.16BR D	Floodway	948.15	0.32	948.48	124.00		7348.00		930.00	891.00	1109.00	1060.00
Reach-1	32978.16BR U	Natural	947.92		948.18	179.53		7348.00		891.00	891.00	1109.00	
Reach-1	32978.16BR U	Floodway	948.21	0.30	948.59	114.00		7348.00		932.00	891.00	1109.00	1052.00
Reach-1	33046.16	Natural	947.98		948.23	185.98		7348.00		891.00	891.00	1109.00	
Reach-1	33046.16	Floodway	948.31	0.32	948.64	120.00		7348.00		932.00	891.00	1109.00	
Reach-1	33155.58	Natural	947.88		948.61	169.06		1933.68	4693.94	720.39	982.00	1015.00	
Reach-1	33155.58	Floodway	948.22	0.34	949.04	110.00		1784.79	4936.78	646.43	930.00	982.00	1015.00
Reach-1	34068.65	Natural	949.73		950.22	265.47		927.61	4765.06	1655.33	980.00	980.00	1020.00
Reach-1	34068.65	Floodway	950.15	0.42	950.73	120.00		815.77	5113.12	1419.10	950.00	980.00	1020.00
Reach-1	34164.15	Natural	949.83		950.44	99.00		500.63	7627.13	406.24	967.00	967.00	1030.00
Reach-1	34164.15	Floodway	950.30	0.47	950.90	99.00		406.89	7784.42	342.69	948.50	967.00	1030.00
Reach-1	34250.29	Culvert											
Reach-1	34319.79	Natural	952.34		952.57	335.48		2855.75	3887.74	1790.51	985.00	985.00	1022.00
Reach-1	34319.79	Floodway	952.64	0.31	952.90	223.00		2903.77	4029.10	1601.13	855.00	985.00	1022.00
Reach-1	34887.32 NEW	Natural	952.81		952.87	687.11		5601.74	2099.53	832.73	481.60	481.60	514.97
Reach-1	34887.32 NEW	Floodway	953.13	0.32	953.29	262.00		4286.00	2997.74	1250.26	328.00	481.60	514.97
Reach-1	35731.12	Natural	953.10		953.20	580.40		3788.93	2673.59	2071.48	1971.90	1971.90	2009.50
Reach-1	35731.12	Floodway	953.63	0.53	953.74	390.00		3744.80	2779.34	2009.86	1740.00	1971.90	2009.50
Reach-1	36431.22	Natural	953.38		953.44	434.89		2520.13	1995.30	984.57	980.00	980.00	1020.00
Reach-1	36431.22	Floodway	953.91	0.53	953.97	320.00		2377.08	2063.90	1039.02	800.00	980.00	1020.00
Reach-1	36570.11	Natural	953.41		953.47	543.82		1258.05	2999.15	1212.80	962.00	962.00	1044.00
Reach-1	36570.11	Floodway	953.94	0.53	954.01	360.00		1076.30	3170.40	1233.30	820.00	962.00	1044.00
Reach-1	36665.49	Culvert											
Reach-1	36721.49	Natural	954.09		954.27	446.02		410.62	4634.93	434.45	952.00	952.00	1040.00
Reach-1	36721.49	Floodway	954.92	0.83	955.10	180.00		284.69	4880.51	334.80	915.00	915.00	1040.00
Reach-1	36788.68	Natural	954.17		954.31	368.34		733.37	1707.63	3054.99	990.00	990.00	1012.00
Reach-1	36788.68	Floodway	954.98	0.81	955.14	180.00		936.11	1813.67	2746.22	940.00	940.00	1012.00

HEC-RAS Plan: CE FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	37048.76 NEW	Natural	954.28		954.61	168.86	171.59	2030.70	3293.70	153.22	174.49		
Reach-1	37048.76 NEW	Floodway	955.07	0.79	955.45	135.00	206.05	2211.01	3078.94	138.00	153.22	174.49	273.00
Reach-1	37465.78	Natural	954.84		955.30	204.43	980.06	2614.91	1901.04	1992.00	2018.00		
Reach-1	37465.78	Floodway	955.60	0.76	956.14	125.00	1168.07	2857.04	1470.89	1945.00	1982.00	2018.00	2070.00
Reach-1	37864.34 NEW	Natural	955.37		955.61	217.81	628.93	1619.42	3247.66	155.62	172.96		
Reach-1	37864.34 NEW	Floodway	956.18	0.81	956.45	170.00	704.52	1748.17	3043.31	120.00	155.62	172.96	290.00
Reach-1	38162.53	Natural	955.78		955.80	729.45	396.83	812.66	4286.51		1990.00	2016.00	
Reach-1	38162.53	Floodway	956.62	0.84	956.64	470.00	481.89	916.04	4098.07	1830.00	1990.00	2016.00	2400.00
Reach-1	39108.84 NEW	Natural	955.94		956.19	345.16	1422.60	2187.61	1885.78		298.65	329.21	
Reach-1	39108.84 NEW	Floodway	956.75	0.81	957.05	230.00	1643.14	2427.73	1425.14	200.00	296.65	329.21	430.00
Reach-1	39458.28	Natural	955.85		957.47	123.75	1107.18	4016.12	372.70		980.00	1012.00	
Reach-1	39458.28	Floodway	956.77	0.93	958.17	100.00	990.59	4028.57	476.84	945.00	980.00	1012.00	1045.00
Reach-1	39777.89 NEW	Natural	957.98		958.20	176.63	483.55	4783.82	228.64		945.74	1033.93	
Reach-1	39777.89 NEW	Floodway	958.54	0.56	958.80	110.00	56.89	5231.65	207.46	940.00	945.74	1033.93	1050.00
Reach-1	40471.23	Culvert											
Reach-1	41077.23 NEW	Natural	959.93		960.07	184.34	230.35	5239.20	26.45		947.86	1061.88	
Reach-1	41077.23 NEW	Floodway	960.49	0.56	960.63	130.00	38.05	5432.61	25.34	940.00	947.86	1061.88	1070.00
Reach-1	41269.88	Natural	960.03		960.15	527.23	3428.45	1580.69	486.86		923.00	948.00	
Reach-1	41269.88	Floodway	960.56	0.54	960.71	380.00	3191.80	1734.02	570.18	605.00	923.00	948.00	985.00
Reach-1	42211.00	Natural	960.67		960.74	717.53	1073.83	1463.75	2958.43		1982.90	2017.60	
Reach-1	42211.00	Floodway	961.24	0.57	961.34	390.00	1353.66	1646.95	2495.38	1850.00	1982.90	2017.60	2240.00
Reach-1	42778.44	Natural	961.11		961.28	562.49	3435.30	1675.13	385.58		1986.00	2014.00	
Reach-1	42778.44	Floodway	961.70	0.58	962.00	300.00	2837.09	2113.04	545.87	1760.00	1986.00	2014.00	2060.00
Reach-1	43468.18	Natural	962.16		962.26	744.04	3145.27	1138.88	1211.85		1985.00	2009.00	
Reach-1	43468.18	Floodway	963.01	0.85	963.16	400.00	3137.69	1341.58	1016.73	1700.00	1985.00	2009.00	2100.00
Reach-1	44309.29	Natural	963.54		964.26	574.21	690.69	2230.15	1333.17		985.00	1015.00	
Reach-1	44309.29	Floodway	964.31	0.77	965.25	150.00	689.69	2572.44	1051.88	930.00	985.00	1015.00	1080.00
Reach-1	44438.54 NEW	Natural	965.10	-0.01	966.82	184.00	587.05	2586.15	1559.80		994.06	1016.95	1091.00
Reach-1	44438.54 NEW	Floodway	965.10	-0.01	966.86	184.00	585.25	2613.28	1533.48	907.00	994.06	1016.95	
Reach-1	44531.77BR D	Natural	969.82		969.84	203.87	9.27	4721.30	3.55		969.00	1032.00	
Reach-1	44531.77BR D	Floodway	969.81	-0.02	969.83	180.01	8.07	4722.53	2.78	907.00	969.00	1032.00	1091.00

HEC-RAS Plan: CE FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdh Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	44531.77BR U	Natural	969.82	-0.02	969.84	203.87	9.27	4721.30	3.55	969.00	969.00	1032.00	1032.00
Reach-1	44531.77BR U	Floodway	969.81		969.83	189.68	8.07	4722.53	2.78	670.00	969.00	1032.00	1280.00
Reach-1	44631.27 NEW	Natural	969.82	-0.02	969.83	686.58	1826.62	959.94	1945.44	978.99	1021.09		
Reach-1	44631.27 NEW	Floodway	969.81		969.82	610.00	1777.19	1026.10	1928.71	670.00	978.99	1021.09	1280.00
Reach-1	44700.35	Natural	969.83		969.86	680.01	1682.00	1023.88	2026.13		985.00	1015.00	
Reach-1	44700.35	Floodway	969.81	-0.01	969.85	580.00	1746.67	1012.59	1972.74	700.00	985.00	1015.00	1280.00
Reach-1	45408.89	Natural	969.95		969.96	720.94	1950.43	727.78	87.79		977.00	1019.00	
Reach-1	45408.89	Floodway	969.93	-0.02	969.95	608.00	1969.11	730.12	66.77	430.00	977.00	1019.00	1038.00
Reach-1	45689.70 NEW	Natural	969.91		970.14	121.00	914.21	725.59	1126.20		1995.75	2005.59	
Reach-1	45689.70 NEW	Floodway	969.89	-0.02	970.13	121.00	915.76	756.08	1094.16	1939.00	1995.75	2005.59	2060.00
Reach-1	45777 BR D	Natural	967.40		970.14		0.62	2764.77	0.61		1978.50	2021.50	
Reach-1	45777 BR D	Floodway	967.40	0.00	970.13		0.62	2764.77	0.61	1939.00	1978.50	2021.50	2060.00
Reach-1	45777 BR U	Natural	967.40		971.33	40.00		2766.00			1978.50	2021.50	
Reach-1	45777 BR U	Floodway	967.40	0.00	971.31	40.00		2766.00		1935.00	1978.50	2021.50	2060.00
Reach-1	45868.71 NEW	Natural	971.06		971.34	121.00	724.16	1309.36	732.49		1987.98	2014.36	
Reach-1	45868.71 NEW	Floodway	971.02	-0.04	971.32	121.00	738.00	1338.47	689.54	1935.00	1987.98	2014.36	2060.00
Reach-1	46058.02	Natural	971.43		971.43	1274.48	1833.52	356.53	575.95		1005.50	1040.36	
Reach-1	46058.02	Floodway	971.45	0.02	971.50	300.00	970.51	1018.64	776.85	853.00	1005.50	1040.36	1153.00
Reach-1	46186.37	Natural	971.36		971.49	425.37	1588.00	1008.56	479.44		397.11	425.64	
Reach-1	46186.37	Floodway	971.45	0.09	971.62	240.00	1609.50	1128.44	338.06	240.00	397.11	425.64	480.00
Reach-1	46508.28	Natural	971.75		972.38	262.25	249.82	2408.10	418.08		980.00	1020.00	
Reach-1	46508.28	Floodway	971.92	0.18	972.52	170.00	286.02	2395.46	384.52	909.00	980.00	1020.00	1079.00
Reach-1	46728.27BR D	Natural	973.27		973.81	229.70	1438.24	1094.11	541.24		992.00	1009.00	
Reach-1	46728.27BR D	Floodway	973.43	0.15	974.46	170.00	1166.54	987.74	921.96	909.00	992.00	1009.00	1079.00
Reach-1	46728.27BR U	Natural	973.32		973.81	228.22	1437.67	1094.89	541.04		992.00	1009.00	
Reach-1	46728.27BR U	Floodway	974.13	0.81	974.54	130.00	1165.90	988.62	921.73	925.00	992.00	1009.00	1055.00
Reach-1	46822.27	Natural	975.77		973.81	228.25	688.96	2124.29	262.75		988.00	1022.00	
Reach-1	46822.27	Floodway	976.05	0.28	974.54	130.00	680.78	2091.57	303.65		988.00	1022.00	1055.00
Reach-1	47928.60BR D	Natural	976.05		976.58	386.30	2278.11	627.65	97.84		992.00	1009.00	
Reach-1	47928.60BR D	Floodway	976.60	0.55	976.92	130.00	2300.54	680.50	78.87	900.00	992.00	1009.00	1030.00

HEC-RAS Plan: CE FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Eric Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Eric Sta R (ft)
Reach-1	47928.80BR U	Natural	976.17		976.58	410.08	2278.11	627.71	97.78	992.00	992.00	1009.00	
Reach-1	47928.80BR U	Floodway	976.60	0.43	976.92	218.67	2300.54	680.56	78.82	820.00	992.00	1009.00	1080.00
Reach-1	48121.10	Natural	976.17		976.58	376.88	760.48	2085.09	230.44	980.00	980.00	1020.00	
Reach-1	48121.10	Floodway	976.60	0.43	976.92	260.00	843.36	1972.91	259.73	820.00	980.00	1020.00	1080.00
Reach-1	48220.77	Natural	976.39		977.10	175.85	548.56	2302.13	225.32	980.00	980.00	1020.00	
Reach-1	48220.77	Floodway	976.76	0.37	977.35	167.00	578.35	2232.36	265.29	899.00	980.00	1020.00	1066.00
Reach-1	48358.25BR D	Natural	975.74		979.03	32.00		3076.00		980.00	980.00	1020.00	
Reach-1	48358.25BR D	Floodway	975.79	0.05	979.03	32.00		3076.00	899.00	980.00	980.00	1020.00	1066.00
Reach-1	48358.25BR U	Natural	980.41		981.40	38.00		3076.00		980.00	980.00	1026.00	
Reach-1	48358.25BR U	Floodway	980.39	-0.03	981.38	38.00		3076.00	899.00	980.00	980.00	1026.00	1107.00
Reach-1	48524.75	Natural	981.67		981.74	208.00	805.63	1449.87	820.50	980.00	980.00	1026.00	
Reach-1	48524.75	Floodway	981.65	-0.02	981.72	208.00	782.98	1500.06	792.96	899.00	980.00	1026.00	1107.00
Reach-1	48778.94	Natural	981.78		981.80	519.75	810.71	1060.54	1204.75	980.00	980.00	1026.00	
Reach-1	48778.94	Floodway	981.74	-0.04	981.80	250.00	690.00	1360.71	1025.29	900.00	980.00	980.00	1150.00
Reach-1	49005.34 NEW	Natural	981.81		981.85	396.64	69.68	852.29	1512.04	986.57	986.57	1016.40	
Reach-1	49005.34 NEW	Floodway	981.81	-0.01	981.86	233.00	85.50	985.02	1363.48	967.00	986.57	1016.40	1200.00
Reach-1	49089	Culvert											
Reach-1	49133.73 NEW	Natural	982.36		982.39	368.51	53.20	1268.26	1112.53	980.14	1037.69		
Reach-1	49133.73 NEW	Floodway	982.40	0.04	982.46	185.00	25.99	1657.15	850.85	974.00	980.14	1037.69	1159.00
Reach-1	49234.85	Natural	982.37		982.40	344.69	146.15	912.85	1375.00	980.00	980.00	1020.00	
Reach-1	49234.85	Floodway	982.42	0.05	982.48	195.00	166.31	1155.50	1112.19	945.00	980.00	1020.00	1140.00
Reach-1	49847.50 NEW	Natural	982.52		982.59	260.52	285.74	514.03	1634.23	278.08	278.08	294.74	
Reach-1	49847.50 NEW	Floodway	982.65	0.13	982.72	220.00	298.81	522.40	1611.79	230.00	278.08	294.74	450.00
Reach-1	50185.30	Natural	982.79		982.89	338.69	747.39	974.56	712.05	374.16	374.16	407.90	
Reach-1	50185.30	Floodway	982.91	0.13	983.10	200.00	382.53	1199.09	852.38	331.00	374.16	407.90	531.00
Reach-1	51158.38 AD	Natural	984.42		985.02	305.20	518.31	1883.96	31.73	745.43	745.43	789.74	
Reach-1	51158.38 AD	Floodway	985.06	0.64	985.67	116.00	369.84	2011.25	52.92	688.00	745.43	789.74	804.00
Reach-1	51636.06 NEW	Natural	986.76		987.15	276.19	603.58	1771.69	58.73	329.93	329.93	377.67	
Reach-1	51636.06 NEW	Floodway	987.15	0.39	987.61	150.00	413.92	1945.38	74.70	245.00	329.93	377.67	395.00
Reach-1	52150.00	Natural	989.12		989.94	226.72	1040.75	1266.31	126.94	1984.00	1984.00	2008.00	
Reach-1	52150.00	Floodway	989.41	0.29	990.43	150.00	836.77	1413.18	184.05	1900.00	1984.00	2008.00	2050.00

HEC-RAS Plan: CE FW River: RIVER-1 Reach: Reach 1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top With Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	53057.03	Natural	993.30		993.51	359.83	439.57	1181.86	812.57				
Reach-1	53057.03	Floodway	993.83	0.54	994.11	150.00	409.71	1359.83	664.46	940.00	985.00	985.00	1020.00
Reach-1	53808.67	Natural	994.86		994.95	286.31	93.10	488.67	165.23				
Reach-1	53808.67	Floodway	995.48	0.62	995.65	60.00	30.93	673.57	42.50	970.00	979.00	979.00	1020.00
Reach-1	54001.22 NEW	Natural	997.28		998.40	67.00	29.34	652.28	65.38				
Reach-1	54001.22 NEW	Floodway	997.27	-0.02	998.41	67.00	28.54	655.81	62.66	966.00	991.57	991.57	1008.72
Reach-1	54194.68	Culvert											
Reach-1	54469.68 AF	Natural	1014.62		1014.63	67.00	66.20	603.92	76.88				
Reach-1	54469.68 AF	Floodway	1014.62	0.00	1014.63	67.00	40.19	656.48	50.33	966.00	977.57	977.57	1019.12
Reach-1	54818.80	Natural	1014.63		1014.63	489.84	835.88	707.88	917.24				
Reach-1	54818.80	Floodway	1014.63	0.00	1014.63	360.00	834.91	718.28	907.81	1835.00	1980.00	1980.00	2020.00
Reach-1	54941.18	Culvert											
Reach-1	55057.68	Natural	1014.66		1014.66	837.95	1295.49	266.37	889.14				
Reach-1	55057.68	Floodway	1014.64	-0.02	1014.65	240.00	685.13	498.91	1286.95	1914.00	1990.00	1990.00	2154.00
Reach-1	55098.61	Natural	1014.66		1014.66	800.81	1233.71	620.67	606.61				
Reach-1	55098.61	Floodway	1014.64	-0.02	1014.66	160.00	598.12	1302.86	560.02	1920.00	1977.10	1977.10	2026.90
Reach-1	55342.61	Natural	1014.66		1014.67	766.09	1148.86	690.22	621.92				
Reach-1	55342.61	Floodway	1014.67	0.01	1014.68	260.00	767.29	955.27	738.44	1872.00	1977.10	1977.10	2026.90
Reach-1	55522.33	Culvert											
Reach-1	55668.33	Natural	1014.67		1014.68	755.26	1148.21	565.12	747.67				
Reach-1	55668.33	Floodway	1014.69	0.02	1014.70	319.00	1034.17	672.46	754.37	1805.00	1977.10	1977.10	2011.70
Reach-1	55788.73	Natural	1014.68		1014.70	317.78	1161.60	1241.44	57.96				
Reach-1	55788.73	Floodway	1014.70	0.02	1014.72	220.00	1106.99	1292.90	61.11	1828.00	1972.00	1972.00	2028.00
Reach-1	56569.00 NEW	Natural	1014.77		1014.93	122.66	729.53	1496.94	234.52				
Reach-1	56569.00 NEW	Floodway	1014.80	0.03	1014.96	120.00	687.41	1525.89	247.71	380.00	438.96	438.96	473.32
Reach-1	56628.59	Culvert											
Reach-1	56726.59 NEW	Natural	1018.40		1018.42	409.63	1172.71	889.39	398.90				
Reach-1	56726.59 NEW	Floodway	1018.86	0.46	1018.95	115.00	610.89	1550.69	299.42	390.00	436.30	436.30	474.36
Reach-1	56849.09	Natural	1018.43		1018.44	477.11	1853.95	425.99	181.06				
Reach-1	56849.09	Floodway	1018.98	0.56	1019.00	310.00	1786.59	458.73	215.69	1756.00	1990.00	1990.00	2010.00

HEC-RAS Plan: CE FW River: RIVER-1 Reach: Reach 1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	57843.30	Natural	1018.89		1018.82	378.92	1002.39	952.83	505.78		1986.00	2011.00	
Reach-1	57843.30	Floodway	1019.22	0.53	1019.39	150.00	959.81	1061.93	439.26	1910.00	1986.00	2011.00	2050.00
Reach-1	57834.79	Natural	1019.18		1019.57	375.44	420.60	1505.29	535.10		990.00	1020.00	
Reach-1	57834.79	Floodway	1019.71	0.53	1020.10	130.00	392.05	1568.62	500.33	935.00	990.00	1020.00	1065.00
Reach-1	58288.38 NEW	Natural	1020.64		1021.71	92.49	237.00	2136.26	87.75		990.16	1024.66	
Reach-1	58289.38 NEW	Floodway	1020.98	0.35	1021.91	85.00	255.33	2100.13	105.54	951.00	990.16	1024.66	1036.00
Reach-1	58351.73BR D	Natural	1022.98		1023.15	347.91	444.32	1668.48	348.11		990.00	1013.00	
Reach-1	58351.73BR D	Floodway	1023.41	0.42	1023.92	85.00	282.78	1885.94	289.87	951.00	990.00	1013.00	1036.00
Reach-1	58351.73BR U	Natural	1022.98		1023.15	376.66	444.32	1668.48	348.11		990.00	1013.00	
Reach-1	58351.73BR U	Floodway	1023.41	0.42	1023.92	101.00	282.78	1885.94	289.87	951.00	990.00	1013.00	1052.00
Reach-1	58415.23	Natural	1022.98		1023.15	418.54	918.73	985.50	556.78		993.10	1012.70	
Reach-1	58415.23	Floodway	1023.41	0.42	1023.92	101.00	514.43	1489.17	457.41	951.00	993.10	1012.70	1052.00
Reach-1	58519.71	Natural	1023.03		1023.90	142.20	376.76	1422.35	661.88		294.42	311.84	
Reach-1	58519.71	Floodway	1023.68	0.85	1024.50	100.00	426.10	1332.89	702.01	260.00	294.42	311.84	360.00
Reach-1	58683.98 NEW	Natural	1025.03		1025.36	273.78	632.02	677.16	1151.82		363.74	373.51	
Reach-1	58683.98 NEW	Floodway	1025.18	0.15	1026.02	100.00	635.25	946.14	879.61	330.00	363.74	373.51	430.00

**PROPOSED CONDITIONS MODEL
FLOODWAY**

HEC-RAS Plan Prop FW River: RIVER-1 Reach: Reach-1

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	203.92	Natural	893.21		894.29	340.19	3218.68	13578.56	11175	1947.70	2057.80	
Reach-1	203.92	Floodway	893.21	-0.01	894.29	290.00	3213.37	13584.33	11131	1790.00	1947.70	2057.80
Reach-1	776.77 NEW	Natural	894.66		894.84	839.76	4219.40	6299.09	6280.52	990.80	1057.56	
Reach-1	776.77 NEW	Floodway	894.65	0.00	894.94	590.00	5246.90	7363.54	4298.55	724.00	990.80	1057.56
Reach-1	1621.49	Natural	894.97		895.67	928.32	1314.46	7660.29	7934.25	1974.98	2023.08	
Reach-1	1621.49	Floodway	894.96	0.00	896.15	600.00	1635.12	9153.26	6120.61	1800.00	1974.98	2023.08
Reach-1	3153.49	Natural	897.84		899.14	441.64	3493.10	12720.85	695.05	1954.50	2041.10	
Reach-1	3153.49	Floodway	898.59	0.75	899.77	330.00	3388.07	12742.21	778.71	1765.00	1954.50	2041.10
Reach-1	4578.80	Natural	901.63		902.45	343.98	1204.04	9750.79	5879.17	970.00	1030.00	
Reach-1	4578.80	Floodway	901.92	0.29	902.78	225.00	1216.74	9856.63	5660.64	930.00	970.00	1030.00
Reach-1	4753.78	Natural	901.97		903.21	172.13	296.63	16327.63	209.74	938.80	1064.20	
Reach-1	4753.78	Floodway	902.27	0.30	903.50	140.00	180.62	16556.91	96.47	930.00	938.80	1064.20
Reach-1	4858.98 BR D	Natural	902.38		903.91	119.40		17271.00		938.80	1064.20	
Reach-1	4858.98 BR D	Floodway	902.69	0.30	904.15	119.40		17271.00		930.00	938.80	1064.20
Reach-1	4858.98 BR U	Natural	902.79		904.23	119.40		17271.00		938.80	1064.20	
Reach-1	4858.98 BR U	Floodway	903.06	0.27	904.46	119.40		17271.00		857.80	938.80	1064.20
Reach-1	4958.98	Natural	904.22		904.70	287.40	4468.73	9243.17	3559.10	975.00	1040.00	
Reach-1	4958.98	Floodway	904.41	0.19	904.91	287.40	4392.20	9398.81	3480.00	857.80	975.00	1040.00
Reach-1	5488.69 NEW	Natural	904.98		905.02	1320.08	5923.16	3122.35	8225.49	934.25	985.00	
Reach-1	5488.69 NEW	Floodway	905.19	0.22	905.32	610.00	5030.40	4548.25	7692.35	700.00	934.25	985.00
Reach-1	5940.21	Natural	905.05		905.10	1798.48	7448.19	4232.39	5590.43	1968.00	2043.00	
Reach-1	5940.21	Floodway	905.35	0.30	905.47	736.00	5216.93	5738.93	6315.14	1670.00	1968.00	2043.00
Reach-1	7286.45	Natural	905.32		905.59	697.23	4398.64	6463.77	6407.59	1965.50	2023.80	
Reach-1	7286.45	Floodway	905.79	0.47	906.24	460.00	5142.20	7950.74	4178.07	1735.00	1965.50	2023.80
Reach-1	8445.73	Natural	906.06		907.26	385.56	2217.95	11359.20	3693.84	1961.40	2026.30	
Reach-1	8445.73	Floodway	906.93	0.87	907.98	290.00	2449.53	11234.63	3586.85	1875.00	1961.40	2026.30
Reach-1	9055.09	Natural	907.50		908.46	197.00	3474.21	10285.70	3511.09	972.00	1028.00	
Reach-1	9055.09	Floodway	908.06	0.56	909.02	197.00	3363.22	10540.85	3366.94	903.00	972.00	1028.00
Reach-1	9202.15 BR D	Natural	905.98		910.36	50.00		14423.00		903.00	972.00	1028.00
Reach-1	9202.15 BR D	Floodway	906.69	0.71	910.73	50.00		14423.00			903.00	972.00
Reach-1	9202.15 BR U	Natural	907.31		911.08	50.00		14423.00			903.00	972.00
Reach-1	9202.15 BR U	Floodway	907.77	0.46	911.36	50.00		14423.00			903.00	972.00

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	9298.15	Natural	911.07		912.11	194.69	3368.99	9355.54	1698.47	980.00	1028.00		
Reach-1	9298.15	Floodway	911.29	0.21	912.33	187.00	3195.78	9451.92	1775.30	903.00	980.00	1028.00	1090.00
Reach-1	10400.82	Natural	912.93		913.25	466.18	4685.10	6560.65	3177.26	1980.00	2030.00		
Reach-1	10400.82	Floodway	913.12	0.18	913.50	285.00	3925.44	7017.25	3480.31	1865.00	1980.00	2030.00	2150.00
Reach-1	10946.58 NEW	Natural	912.91		913.91	285.89	2256.55	7443.31	4723.14	291.88	325.08		
Reach-1	10946.58 NEW	Floodway	913.14	0.24	914.18	215.00	1883.86	7561.21	4977.93	235.00	291.88	325.08	450.00
Reach-1	11699.81	Natural	914.24		914.46	545.28	5486.30	8251.12	685.58	1927.10	2018.10		
Reach-1	11699.81	Floodway	914.49	0.25	914.78	297.00	4474.39	9173.72	774.89	1773.00	1927.10	2018.10	2070.00
Reach-1	12238.78 NEW	Natural	914.55		914.57	1244.73	7104.38	2702.02	4616.60	1262.92	1321.01		
Reach-1	12238.78 NEW	Floodway	914.88	0.33	915.01	470.00	6797.25	4958.02	2867.73	972.00	1262.92	1321.01	1442.00
Reach-1	13462.07	Natural	914.66		914.71	813.10	5038.36	2469.30	6915.34	1978.30	2022.20		
Reach-1	13462.07	Floodway	915.22	0.55	915.29	520.00	5100.03	3105.07	6217.90	1760.00	1978.30	2022.20	2280.00
Reach-1	14756.18	Natural	914.85		914.88	1480.52	5541.58	2073.37	6808.05	1970.20	2021.00		
Reach-1	14756.18	Floodway	915.52	0.67	915.60	680.00	4187.40	3405.07	6830.54	1666.00	1970.20	2021.00	2346.00
Reach-1	16295.42	Natural	915.13		915.17	1304.41	5255.01	2807.90	6360.09	1965.00	2030.00		
Reach-1	16295.42	Floodway	916.00	0.87	916.04	750.00	4562.77	2833.33	7026.90	1680.00	1965.00	2030.00	2410.00
Reach-1	17413.80	Natural	915.59		915.63	1897.15	5158.67	2815.72	6448.62	1970.00	2040.00		
Reach-1	17413.80	Floodway	916.49	0.91	916.65	700.00	4553.14	4730.10	5139.76	1655.00	1970.00	2040.00	2355.00
Reach-1	17515.47	Natural	915.84		915.68	1898.79	5265.64	2827.87	6558.50	1970.00	2040.00		
Reach-1	17515.47	Floodway	916.61	0.97	916.77	700.00	4654.13	4753.21	5244.66	1655.00	1970.00	2040.00	2355.00
Reach-1	17841.44BR D	Natural	918.15		918.17	1494.10	3222.62	8710.82	2701.57	1949.60	2050.40		
Reach-1	17841.44BR D	Floodway	918.23	0.08	918.90	700.00	3524.67	8922.10	2193.49	1655.00	1949.60	2050.40	2355.00
Reach-1	17748.44 NEW	Natural	918.15		918.17	1802.78	7812.77	1744.54	5094.69	1967.33	2029.17		
Reach-1	17748.44 NEW	Floodway	918.69	0.53	918.90	550.00	3524.67	8922.10	2193.49	1648.00	1967.33	2029.17	2198.00
Reach-1	17813.81	Natural	918.12		918.28	1252.38	8560.92	4090.99	2000.08	1980.00	2027.00		
Reach-1	17813.81	Floodway	918.72	0.60	919.13	530.00	5765.47	5628.48	3058.05	1654.00	1980.00	2027.00	2184.00
Reach-1	18146.32	Natural	918.51		918.75	627.74	9171.43	5170.71	309.86	1972.00	2028.00		
Reach-1	18146.32	Floodway	919.45	0.93	919.76	400.00	8280.93	5984.26	386.81	1650.00	1972.00	2028.00	2050.00
Reach-1	18651.90	Natural	919.04		919.70	518.83	2087.53	7117.65	5446.83	1980.00	2030.00		

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	18651.80	Floodway	920.05	1.00	920.63	390.00	2667.03	7069.48	4915.49	1795.00	1980.00	2030.00	2185.00
Reach-1	20340.54	Natural	922.07		922.33	769.63	3718.54	4870.16	6063.30	1967.10	2022.10		
Reach-1	20340.54	Floodway	922.86	0.79	923.30	400.00	1949.49	6066.54	6635.97	1895.00	1967.10	2022.10	2295.00
Reach-1	20788.78 NEW	Natural	922.69		923.13	516.55	1300.58	5672.85	7678.57	673.37	725.69		
Reach-1	20788.78 NEW	Floodway	923.66	0.97	924.13	370.00	1655.37	6096.97	6899.66	600.00	673.37	725.69	970.00
Reach-1	21440.00	Natural	923.73		923.90	721.73	10105.46	4351.59	194.95	1975.00	2030.00		
Reach-1	21440.00	Floodway	924.67	0.94	924.90	437.00	9475.94	4908.56	267.50	1623.00	1975.00	2030.00	2060.00
Reach-1	22221.01 NEW	Natural	924.25		924.31	1144.61	5271.26	2911.43	2927.31	988.66	1050.16		
Reach-1	22221.01 NEW	Floodway	925.23	0.98	925.30	800.00	6029.48	3133.54	1946.98	500.00	988.66	1050.16	1300.00
Reach-1	23217.98	Natural	923.97		926.33	150.66	2488.08	8123.30	498.62	980.00	1020.00		
Reach-1	23217.98	Floodway	924.96	1.00	927.13	100.00	2384.77	8228.74	498.49	935.00	980.00	1020.00	1035.00
Reach-1	23378.74BR D	Natural	925.64		927.61	120.60	2914.64	8382.44	619.92	980.00	1020.00		
Reach-1	23378.74BR D	Floodway	926.44	0.81	928.25	100.00	2894.27	8358.25	664.48	935.00	980.00	1020.00	1035.00
Reach-1	23378.74BR U	Natural	926.52		927.92	146.88	2092.56	8777.83	1046.61	980.00	1028.00		
Reach-1	23378.74BR U	Floodway	927.31	0.79	928.53	145.78	2136.70	8643.95	1136.35	870.00	980.00	1028.00	1070.00
Reach-1	23477.24	Natural	927.63		928.28	227.41	4009.69	6998.17	909.14	980.00	1028.00		
Reach-1	23477.24	Floodway	928.10	0.47	928.82	200.00	3533.00	7373.31	1010.69	870.00	980.00	1028.00	1070.00
Reach-1	24584.31	Natural	929.08		929.36	361.31	4482.29	7108.54	326.17	557.00	635.19		
Reach-1	24584.31	Floodway	929.60	0.52	929.96	280.00	3714.58	7852.94	349.48	400.00	557.00	635.19	660.00
Reach-1	24778.87 NEW	Natural	929.22		929.52	383.27	2871.79	4521.22	4523.99	641.15	683.91		
Reach-1	24778.87 NEW	Floodway	929.86	0.65	930.14	375.00	2982.05	4461.02	4473.93	505.00	641.15	683.91	880.00
Reach-1	24842.55BR D	Natural	929.13		929.66	342.80	3703.69	5694.58	2518.74	650.00	695.00		
Reach-1	24842.55BR D	Floodway	929.79	0.66	930.26	325.00	3674.77	5619.84	2622.39	505.00	650.00	695.00	880.00
Reach-1	24842.55BR U	Natural	929.25		929.77	343.35	3708.80	5673.81	2534.39	650.00	695.00		
Reach-1	24842.55BR U	Floodway	929.90	0.65	930.35	345.43	3731.70	5584.77	2620.52	450.00	650.00	695.00	880.00
Reach-1	24942.55 NEW	Natural	929.69		929.91	420.00	4004.05	4007.60	3905.35	642.06	683.63		
Reach-1	24942.55 NEW	Floodway	930.27	0.58	930.47	430.00	4007.32	4003.00	3906.69	450.00	642.06	683.63	880.00
Reach-1	26158.34	Natural	930.71		931.03	488.67	1174.78	7647.13	3095.09	1975.20	2077.70		
Reach-1	26158.34	Floodway	931.19	0.48	931.54	345.00	1121.40	8004.47	2791.13	1900.00	1975.20	2077.70	2245.00
Reach-1	27163.80	Natural	931.75		932.27	577.53	1405.09	5475.63	5036.28	970.00	1020.00		
Reach-1	27163.80	Floodway	932.17	0.42	933.02	313.00	1807.49	6637.58	3471.93	862.00	970.00	1020.00	1175.00

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Wdth Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	27924.78	Natural	933.39		935.22	115.96		11917.00		910.00	1073.00		
Reach-1	27924.79	Floodway	934.30	0.91	935.82	115.90		11917.00		934.40	910.00	1073.00	1050.30
Reach-1	28138.56BR D	Natural	934.59		936.02	121.53		11917.00		910.00	1073.00		
Reach-1	28138.56BR D	Floodway	935.11	0.52	936.42	115.90		11917.00		934.40	910.00	1073.00	1050.30
Reach-1	28138.56BR U	Natural	935.37		936.60	125.16		11917.00		910.00	1073.00		
Reach-1	28138.56BR U	Floodway	935.77	0.40	936.91	127.02		11917.00		900.00	1073.00	1075.00	
Reach-1	28275.58	Natural	934.88		937.63	245.39	1913.32	8886.01	1117.68	982.00	1020.00		
Reach-1	28275.58	Floodway	935.26	0.38	937.91	175.00	1785.69	8918.79	1212.52	900.00	982.00	1020.00	1075.00
Reach-1	28014.22	Natural	939.35		940.48	259.80	4844.36	5639.33	1633.31	989.00	1015.00		
Reach-1	28014.22	Floodway	939.46	0.11	940.68	195.00	4330.96	5784.89	1801.16	880.00	989.00	1015.00	1075.00
Reach-1	29655.01	Natural	940.86		940.96	739.58	742.54	4116.67	7057.79	1968.90	2031.70		
Reach-1	29655.01	Floodway	941.11	0.25	941.28	500.00	976.64	5057.29	5883.08	1860.00	1968.90	2031.70	2360.00
Reach-1	30358.55 NEW	Natural	941.05		941.08	8569.26	6832.24	2427.05	2657.71	818.99	872.40		
Reach-1	30358.55 NEW	Floodway	941.40	0.35	941.50	416.00	6251.35	3668.71	1996.94	530.00	818.99	872.40	946.00
Reach-1	31128.08	Natural	940.63		942.13	238.13	3825.69	6323.38	1767.93	989.00	1020.00		
Reach-1	31128.08	Floodway	941.29	0.67	942.76	200.00	3558.12	6429.73	1929.15	883.00	989.00	1020.00	1083.00
Reach-1	31244.21BR D	Natural	942.18		942.71	24.60		11917.00		913.00	1133.00		
Reach-1	31244.21BR D	Floodway	942.50	0.32	943.28	0.13		11917.00		883.00	913.00	1133.00	1083.00
Reach-1	31244.21BR U	Natural	942.59		943.12			11917.00		913.00	1133.00		
Reach-1	31244.21BR U	Floodway	942.82	0.24	944.50			11917.00		945.00	913.00	1133.00	1045.00
Reach-1	31353.71	Natural	942.10		944.21	151.46	1878.08	8493.62	1545.30	980.00	1018.00		
Reach-1	31353.71	Floodway	943.09	0.98	945.12	100.00	1796.20	8704.25	1416.56	945.00	980.00	1018.00	1045.00
Reach-1	32008.58	Natural	945.83		946.04	262.24	2640.05	4124.21	583.74	980.00	1028.00		
Reach-1	32008.58	Floodway	946.57	0.74	946.77	190.00	2641.28	4113.30	583.42	870.00	980.00	1028.00	1060.00
Reach-1	32395.49BR D	Natural	946.10		946.26	191.14		7348.00		880.00	1121.00		
Reach-1	32395.49BR D	Floodway	946.80	0.70	946.96	160.40		7348.00		870.00	880.00	1121.00	1060.00
Reach-1	32395.49BR U	Natural	946.16		946.32	191.50		7348.00		880.00	1121.00		
Reach-1	32395.49BR U	Floodway	946.85	0.69	947.01	159.00		7348.00		918.00	880.00	1121.00	1083.00
Reach-1	32498.49	Natural	946.01		946.50	227.74	1498.79	4686.47	1162.74	985.00	1021.00		
Reach-1	32498.49	Floodway	946.73	0.72	947.15	165.00	1556.39	4575.60	1216.02	918.00	985.00	1021.00	1083.00
Reach-1	32838.11	Natural	946.20		947.58	124.98	844.07	5516.63	987.30	990.00	1020.00		
Reach-1	32838.11	Floodway	946.89	0.69	948.04	115.00	957.68	5320.20	1070.13	945.00	990.00	1020.00	1060.00

HEC-RAS Plan: Prop FW River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	32909.32	Natural	947.79		948.05	184.72		7348.00			891.00	1109.00	
Reach-1	32909.32	Floodway	948.12	0.32	948.43	130.00		7348.00		930.00	891.00	1109.00	1060.00
Reach-1	32976.16BR D	Natural	947.82		948.09	178.91		7348.00			891.00	1109.00	
Reach-1	32976.16BR D	Floodway	948.14	0.32	948.48	124.00		7348.00		930.00	891.00	1109.00	1060.00
Reach-1	32976.16BR U	Natural	947.91		948.18	179.49		7348.00			891.00	1109.00	
Reach-1	32976.16BR U	Floodway	948.21	0.30	948.58	114.00		7348.00		932.00	891.00	1109.00	1052.00
Reach-1	33046.16	Natural	947.98		948.22	185.94		7348.00			891.00	1109.00	
Reach-1	33046.16	Floodway	948.30	0.32	948.64	120.00		7348.00		932.00	891.00	1109.00	1052.00
Reach-1	33155.58	Natural	947.87		948.61	169.02	1933.18	4694.79	720.03		982.00	1015.00	
Reach-1	33155.58	Floodway	948.22	0.34	949.04	110.00	1764.48	4937.25	646.27	930.00	982.00	1015.00	1040.00
Reach-1	34068.85	Natural	949.73		950.22	265.42	927.31	4765.70	1654.99		980.00	1020.00	
Reach-1	34068.85	Floodway	950.15	0.42	950.73	120.00	815.69	5113.39	1418.93	950.00	980.00	1020.00	1070.00
Reach-1	34184.15	Natural	949.83		950.43	99.00	500.53	7627.33	406.14		967.00	1030.00	
Reach-1	34184.15	Floodway	950.29	0.47	950.90	99.00	406.83	7784.55	342.62	948.50	967.00	1030.00	1047.50
Reach-1	34250.28	Culvert											
Reach-1	34318.79	Natural	952.33		952.56	335.44	2855.63	3887.91	1790.46		985.00	1022.00	
Reach-1	34318.79	Floodway	952.64	0.31	952.90	223.00	2903.61	4029.29	1601.10	855.00	985.00	1022.00	1078.00
Reach-1	34887.32 NEW	Natural	952.81		952.87	687.07	5601.64	2099.67	832.69		481.60	514.97	
Reach-1	34887.32 NEW	Floodway	953.13	0.32	953.29	262.00	4285.99	2997.84	1250.17	328.00	481.60	514.97	590.00
Reach-1	35731.12	Natural	953.10		953.20	580.38	3768.82	2673.78	2071.40		1971.90	2009.50	
Reach-1	35731.12	Floodway	953.63	0.53	953.74	390.00	3744.71	2779.48	2009.81	1740.00	1971.90	2009.50	2130.00
Reach-1	36431.22	Natural	953.38		953.44	494.86	2520.09	1995.38	964.53		980.00	1020.00	
Reach-1	36431.22	Floodway	953.91	0.53	953.97	320.00	2377.05	2063.97	1038.98	800.00	980.00	1020.00	1120.00
Reach-1	36570.11	Natural	953.41		953.47	543.80	1267.93	2899.33	1212.74		962.00	1044.00	
Reach-1	36570.11	Floodway	953.94	0.53	954.01	360.00	1076.23	3170.52	1233.26	820.00	962.00	1044.00	1180.00
Reach-1	36605.49	Culvert											
Reach-1	36721.49	Natural	954.09		954.27	446.00	410.57	4635.06	434.38		952.00	1040.00	
Reach-1	36721.49	Floodway	954.92	0.83	955.10	180.00	284.67	4880.55	334.78	915.00	952.00	1040.00	1095.00
Reach-1	36788.68	Natural	954.17		954.31	369.31	733.34	1707.68	3054.89		990.00	1012.00	
Reach-1	36788.68	Floodway	954.98	0.81	955.14	180.00	936.09	1813.70	2746.21	940.00	990.00	1012.00	1120.00

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	37048.78 NEW	Natural	954.28		954.61	168.86	171.59	2030.74	3293.68	153.22	174.49		
Reach-1	37048.78 NEW	Floodway	955.07	0.79	955.44	135.00	206.04	2211.04	3078.92	138.00	153.22	174.49	273.00
Reach-1	37465.78	Natural	954.84		955.30	204.43	980.04	2614.95	1901.01	1992.00	2018.00		
Reach-1	37465.78	Floodway	955.60	0.76	956.14	125.00	1168.05	2857.07	1470.88	1945.00	1992.00	2018.00	2070.00
Reach-1	37684.34 NEW	Natural	955.37		955.61	217.81	628.92	1619.44	3247.64	155.62	172.96		
Reach-1	37684.34 NEW	Floodway	956.18	0.81	956.45	170.00	704.51	1748.19	3043.30	120.00	155.62	172.96	290.00
Reach-1	38162.53	Natural	955.78		955.80	729.44	396.83	812.67	4286.50	1990.00	1990.00	2016.00	
Reach-1	38162.53	Floodway	956.62	0.84	956.64	470.00	481.88	916.06	4098.06	1930.00	1990.00	2016.00	2400.00
Reach-1	39108.84 NEW	Natural	955.94		956.19	345.15	1422.58	2187.67	1885.75		298.85	329.21	
Reach-1	39108.84 NEW	Floodway	956.75	0.81	957.05	230.00	1643.12	2427.77	1425.11	200.00	298.85	329.21	430.00
Reach-1	39458.26	Natural	955.85		957.47	123.75	1107.15	4016.16	372.69		980.00	1012.00	
Reach-1	39458.26	Floodway	956.77	0.93	958.17	100.00	990.58	4028.60	476.82	945.00	980.00	1012.00	1045.00
Reach-1	39777.89 NEW	Natural	957.98		958.20	176.63	483.54	4783.82	228.64		945.74	1033.93	
Reach-1	39777.89 NEW	Floodway	958.54	0.56	958.80	110.00	56.89	5231.65	207.46	940.00	945.74	1033.93	1050.00
Reach-1	40471.23	Culvert											
Reach-1	41077.23 NEW	Natural	959.93		960.07	184.34	230.35	5239.21	26.45		947.86	1061.88	
Reach-1	41077.23 NEW	Floodway	960.49	0.56	960.63	130.00	38.05	5432.61	25.34	940.00	947.86	1061.88	1070.00
Reach-1	41269.88	Natural	960.03		960.15	527.23	3425.44	1580.71	486.86		923.00	948.00	
Reach-1	41269.88	Floodway	960.56	0.54	960.71	380.00	3191.77	1734.05	570.18	605.00	923.00	948.00	985.00
Reach-1	42211.00	Natural	960.67		960.74	717.53	1073.83	1463.75	2958.42		1982.90	2017.60	
Reach-1	42211.00	Floodway	961.24	0.57	961.34	390.00	1353.65	1646.97	2495.38	1850.00	1982.90	2017.60	2240.00
Reach-1	42778.44	Natural	961.11		961.28	562.49	3435.28	1675.14	385.58		1986.00	2014.00	
Reach-1	42778.44	Floodway	961.69	0.58	962.00	300.00	2837.07	2113.06	545.87	1760.00	1986.00	2014.00	2060.00
Reach-1	43468.18	Natural	962.16		962.26	744.04	3145.27	1138.88	1211.85		1985.00	2009.00	
Reach-1	43468.18	Floodway	963.01	0.85	963.16	400.00	3137.68	1341.58	1016.73	1700.00	1985.00	2009.00	2100.00
Reach-1	44309.29	Natural	963.54		964.26	574.21	690.69	2230.15	1393.17		985.00	1015.00	
Reach-1	44309.29	Floodway	964.31	0.77	965.25	150.00	689.69	2572.44	1051.88	930.00	985.00	1015.00	1080.00
Reach-1	44436.54 NEW	Natural	965.10		966.82	184.00	587.05	2585.15	1559.80		994.06	1016.95	
Reach-1	44436.54 NEW	Floodway	965.10	-0.01	966.86	184.00	595.25	2613.28	1533.48	907.00	994.06	1016.95	1091.00
Reach-1	44531.77BR D	Natural	969.62		969.84	203.87	9.27	4721.30	3.55		969.00	1032.00	
Reach-1	44531.77BR D	Floodway	969.81	-0.02	969.83	180.01	8.07	4722.53	2.78	907.00	969.00	1032.00	1091.00

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W/S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	44531.77BR U	Natural	969.82		969.84	203.87	9.27	4721.30	3.55	969.00	1032.00		
Reach-1	44531.77BR U	Floodway	969.81	-0.02	969.83	189.68	8.07	4722.53	2.78	670.00	969.00	1032.00	1280.00
Reach-1	44631.27 NEW	Natural	969.82		969.83	686.58	1826.62	959.94	1945.44	978.99	1021.09		
Reach-1	44631.27 NEW	Floodway	969.81	-0.02	969.82	610.00	1777.19	1026.10	1928.71	670.00	978.99	1021.09	1280.00
Reach-1	44700.35	Natural	969.83		969.86	660.01	1682.00	1023.88	2026.13		985.00	1015.00	
Reach-1	44700.35	Floodway	969.81	-0.01	969.85	580.00	1746.67	1012.59	1972.74	700.00	985.00	1015.00	1280.00
Reach-1	45408.89	Natural	969.95		969.96	720.94	1950.43	727.78	87.79		977.00	1019.00	
Reach-1	45408.89	Floodway	969.93	-0.02	969.95	608.00	1969.11	730.12	66.77	430.00	977.00	1019.00	1038.00
Reach-1	45689.70 NEW	Natural	969.91		970.14	121.00	914.21	725.59	1126.20		1995.75	2005.59	
Reach-1	45689.70 NEW	Floodway	969.89	-0.02	970.13	121.00	915.78	756.08	1094.16	1939.00	1995.75	2005.59	2060.00
Reach-1	45777 BR D	Natural	967.40		970.14		0.62	2764.77	0.61		1978.50	2021.50	
Reach-1	45777 BR D	Floodway	967.40	0.00	970.13		0.62	2764.77	0.61	1939.00	1978.50	2021.50	2060.00
Reach-1	45777 BR U	Natural	967.40		971.33	40.00		2766.00			1978.50	2021.50	
Reach-1	45777 BR U	Floodway	967.40	0.00	971.31	40.00		2766.00		1935.00	1978.50	2021.50	2060.00
Reach-1	45688.71 NEW	Natural	971.06		971.34	121.00	724.16	1309.36	732.49		1987.98	2014.36	
Reach-1	45688.71 NEW	Floodway	971.02	-0.04	971.32	121.00	738.00	1338.47	689.54	1935.00	1987.98	2014.36	2060.00
Reach-1	46058.02	Natural	971.43		971.43	1274.48	1833.52	356.53	575.95		1005.50	1040.36	
Reach-1	46058.02	Floodway	971.45	0.02	971.50	300.00	970.51	1018.64	776.85	853.00	1005.50	1040.36	1153.00
Reach-1	46186.37	Natural	971.36		971.49	425.37	1588.00	1008.56	479.44		397.11	425.64	
Reach-1	46186.37	Floodway	971.45	0.08	971.62	240.00	1609.50	1128.44	338.06	240.00	397.11	425.64	480.00
Reach-1	46509.28	Natural	971.75		972.38	262.25	249.82	2408.10	418.08		980.00	1020.00	
Reach-1	46509.28	Floodway	971.92	0.18	972.52	170.00	286.02	2395.46	394.52	909.00	980.00	1020.00	1079.00
Reach-1	46728.27BR D	Natural	973.27		973.81	229.70	1438.24	1094.11	541.24		992.00	1009.00	
Reach-1	46728.27BR D	Floodway	973.43	0.15	974.46	170.00	1166.54	987.74	921.96	909.00	992.00	1009.00	1079.00
Reach-1	46728.27BR U	Natural	973.32		973.81	228.22	1437.67	1094.89	541.04		992.00	1009.00	
Reach-1	46728.27BR U	Floodway	974.13	0.81	974.54	130.00	1165.90	988.62	921.73	925.00	992.00	1009.00	1055.00
Reach-1	46822.27	Natural	973.32		973.81	228.26	688.96	2124.29	262.75		988.00	1022.00	
Reach-1	46822.27	Floodway	974.13	0.81	974.54	130.00	680.78	2091.57	303.65	925.00	988.00	1022.00	1055.00
Reach-1	47675.87	Natural	975.77		976.56	292.29	1126.13	1716.64	233.23		990.00	1010.00	
Reach-1	47675.87	Floodway	976.05	0.28	976.86	130.00	1068.23	1748.59	259.19	900.00	990.00	1010.00	1030.00
Reach-1	47928.60BR D	Natural	976.05		976.58	366.30	2278.11	627.65	97.84		992.00	1009.00	
Reach-1	47928.60BR D	Floodway	976.60	0.55	976.92	130.00	2300.54	680.50	78.87	900.00	992.00	1009.00	1030.00

HEC-RAS Plan, Prop FW River RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	47926.60BR U	Natural	976.17		976.58	410.06	2278.11	627.71	97.78	992.00	1009.00		
Reach-1	47926.60BR U	Floodway	976.60	0.43	976.92	218.67	2300.54	680.56	78.82	820.00	992.00	1009.00	1080.00
Reach-1	48121.10	Natural	976.17		976.58	376.88	760.48	2085.09	230.44	980.00	1020.00		
Reach-1	48121.10	Floodway	976.60	0.43	976.92	260.00	843.36	1972.91	259.73	820.00	980.00	1020.00	1080.00
Reach-1	48220.77	Natural	976.39		977.10	175.85	548.56	2302.13	225.32	899.00	980.00	1020.00	
Reach-1	48220.77	Floodway	976.76	0.37	977.35	167.00	578.35	2232.36	265.29	899.00	980.00	1020.00	1086.00
Reach-1	48358.25BR D	Natural	975.74		979.03	32.00		3076.00		980.00	1020.00		
Reach-1	48358.25BR D	Floodway	975.79	0.05	979.03	32.00		3076.00		980.00	1020.00		
Reach-1	48358.25BR U	Natural	980.41		981.40	38.00		3076.00		980.00	1026.00		
Reach-1	48358.25BR U	Floodway	980.39	-0.03	981.38	38.00		3076.00		980.00	1026.00		
Reach-1	48524.75	Natural	981.67		981.74	208.00	805.63	1449.87	820.50	899.00	980.00	1026.00	
Reach-1	48524.75	Floodway	981.65	-0.02	981.72	208.00	782.98	1500.06	792.96	899.00	980.00	1026.00	1107.00
Reach-1	48778.94	Natural	981.78		981.80	519.75	810.71	1060.54	1204.75	980.00	1026.00		
Reach-1	48778.94	Floodway	981.74	-0.04	981.80	250.00	690.00	1360.71	1025.29	900.00	980.00	1026.00	1150.00
Reach-1	49005.34 NEW	Natural	981.81		981.85	396.64	69.68	852.29	1512.04		986.57	1016.40	
Reach-1	49005.34 NEW	Floodway	981.81	-0.01	981.86	233.00	85.50	985.02	1363.48	967.00	986.57	1016.40	1200.00
Reach-1	49069	Culvert											
Reach-1	49133.73 NEW	Natural	982.36		982.39	368.51	53.20	1268.26	1112.53		980.14	1037.69	
Reach-1	49133.73 NEW	Floodway	982.40	0.04	982.46	185.00	25.99	1557.15	850.85	974.00	980.14	1037.69	1159.00
Reach-1	49234.05	Natural	982.37		982.40	344.69	146.15	912.85	1375.00		980.00	1020.00	
Reach-1	49234.05	Floodway	982.42	0.05	982.48	195.00	166.31	1155.50	1112.19	945.00	980.00	1020.00	1140.00
Reach-1	49847.50 NEW	Natural	982.52		982.59	260.52	285.74	514.03	1634.23		278.08	294.74	
Reach-1	49847.50 NEW	Floodway	982.65	0.13	982.72	220.00	289.81	522.40	1611.79	230.00	278.08	294.74	450.00
Reach-1	50185.30	Natural	982.79		982.89	338.69	747.39	974.56	712.05		374.16	407.90	
Reach-1	50185.30	Floodway	982.91	0.13	983.10	200.00	382.53	1199.09	852.38	331.00	374.16	407.90	531.00
Reach-1	51158.38 AD	Natural	984.42		985.02	305.20	518.31	1883.98	31.73		745.43	789.74	
Reach-1	51158.38 AD	Floodway	985.06	0.64	985.67	116.00	369.84	2011.25	52.92	688.00	745.43	789.74	804.00
Reach-1	51636.06 NEW	Natural	988.76		987.15	278.19	603.58	1771.68	58.73		329.93	377.67	
Reach-1	51636.06 NEW	Floodway	987.15	0.39	987.61	150.00	413.92	1945.38	74.70	245.00	328.83	377.67	395.00
Reach-1	52150.00	Natural	989.12		989.94	226.72	1040.75	1266.31	126.94		1984.00	2008.00	
Reach-1	52150.00	Floodway	989.41	0.29	990.43	150.00	836.77	1413.18	184.05	1900.00	1984.00	2008.00	2050.00

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

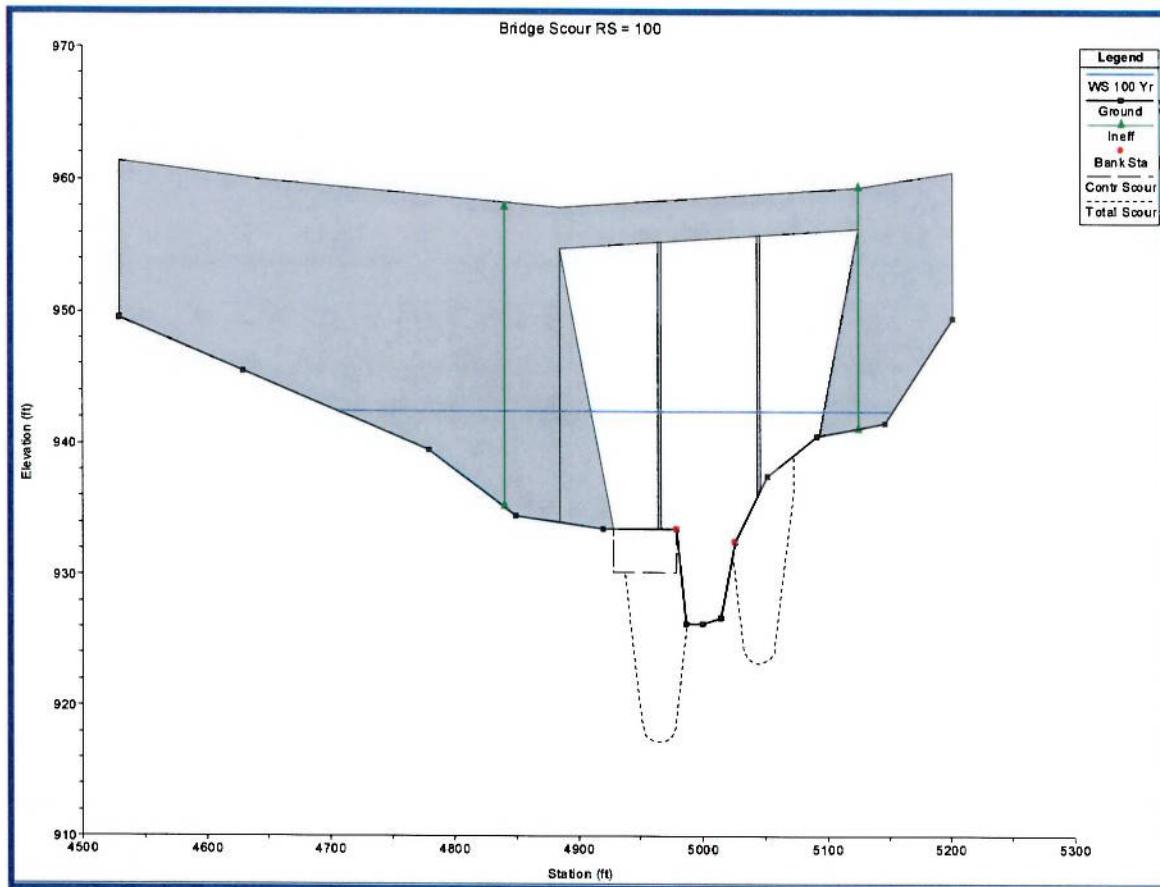
Reach	River Sta	Profile	W.S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Enc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Enc Sta R (ft)
Reach-1	53057.03	Natural	993.30		993.51	359.83	439.57	1181.86	812.57		985.00	1020.00	
Reach-1	53057.03	Floodway	993.83	0.54	994.11	150.00	409.71	1359.83	684.46	940.00	985.00	1020.00	1090.00
Reach-1	5308.67	Natural	994.86		994.95	286.31	93.10	488.67	165.23		979.00	1020.00	
Reach-1	5308.67	Floodway	995.48	0.62	995.65	60.00	30.93	673.57	42.50	970.00	979.00	1020.00	1030.00
Reach-1	54001.22 NEW	Natural	997.28		998.40	67.00	29.34	652.28	65.38		991.57	1008.72	
Reach-1	54001.22 NEW	Floodway	997.27	-0.02	998.41	67.00	28.54	655.81	62.66	966.00	991.57	1008.72	1033.00
Reach-1	54194.88	Culvert											
Reach-1	54469.88 AF	Natural	1014.62		1014.63	67.00	66.20	603.92	76.88		977.57	1019.12	
Reach-1	54469.88 AF	Floodway	1014.62	0.00	1014.63	67.00	40.19	656.48	50.33	966.00	977.57	1019.12	1033.00
Reach-1	54818.80	Natural	1014.63		1014.63	489.84	835.88	707.88	917.24		1980.00	2020.00	
Reach-1	54818.80	Floodway	1014.63	0.00	1014.63	360.00	834.91	718.28	907.81	1835.00	1980.00	2020.00	2195.00
Reach-1	54941.18	Culvert											
Reach-1	55057.98	Natural	1014.66		1014.66	837.95	1235.49	266.37	899.14		1990.00	2010.00	
Reach-1	55057.98	Floodway	1014.64	-0.02	1014.65	240.00	695.13	498.91	1266.95	1914.00	1990.00	2010.00	2154.00
Reach-1	55098.61	Natural	1014.66		1014.66	800.81	1233.71	620.67	606.61		1977.10	2026.90	
Reach-1	55098.61	Floodway	1014.64	-0.02	1014.65	160.00	598.12	1302.86	560.02	1920.00	1977.10	2026.90	2080.00
Reach-1	55342.81	Natural	1014.66		1014.67	768.09	1148.86	690.22	621.92		1977.10	2026.90	
Reach-1	55342.81	Floodway	1014.67	0.01	1014.68	260.00	767.29	955.27	738.44	1872.00	1977.10	2026.90	2132.00
Reach-1	55522.33	Culvert											
Reach-1	55668.33	Natural	1014.67		1014.68	755.26	1148.21	565.12	747.67		1977.10	2011.70	
Reach-1	55668.33	Floodway	1014.69	0.02	1014.70	319.00	1034.17	672.46	754.37	1805.00	1977.10	2011.70	2124.00
Reach-1	55788.73	Natural	1014.68		1014.70	317.78	1161.60	1241.44	57.96		1972.00	2028.00	
Reach-1	55788.73	Floodway	1014.70	0.02	1014.72	220.00	1106.99	1292.90	61.11	1828.00	1972.00	2028.00	2048.00
Reach-1	56569.00 NEW	Natural	1014.77		1014.93	122.66	729.53	1496.94	234.52		438.96	473.32	
Reach-1	56569.00 NEW	Floodway	1014.80	0.03	1014.96	120.00	687.41	1525.89	247.71	390.00	438.96	473.32	510.00
Reach-1	56629.59	Culvert											
Reach-1	56728.59 NEW	Natural	1018.40		1018.42	409.63	1172.71	889.39	388.90		436.30	474.36	
Reach-1	56728.59 NEW	Floodway	1018.86	0.46	1018.95	115.00	610.89	1550.69	289.42	390.00	436.30	474.36	505.00
Reach-1	56849.09	Natural	1018.43		1018.44	477.11	1853.95	425.99	181.06		1990.00	2010.00	
Reach-1	56849.09	Floodway	1018.98	0.56	1019.00	310.00	1786.59	458.73	215.69	1756.00	1990.00	2010.00	2066.00

HEC-RAS Plan: Prop FW River: RIVER-1 Reach: Reach-1 (Continued)

Reach	River Sta	Profile	W/S. Elev (ft)	Prof Delta WS (ft)	E.G. Elev (ft)	Top Width Act	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Emc Sta L (ft)	Ch Sta L (ft)	Ch Sta R (ft)	Emc Sta R (ft)
Reach-1	57643.30	Natural	1018.69		1018.82	378.92	1002.39	952.83	505.78	1986.00	2011.00		
Reach-1	57643.30	Floodway	1019.22	0.53	1019.39	150.00	959.81	1061.93	439.26	1910.00	1986.00	2011.00	2060.00
Reach-1	57834.79	Natural	1019.18		1019.57		375.44	420.60	1505.29	535.10	990.00	1020.00	
Reach-1	57834.79	Floodway	1019.71	0.53	1020.10	130.00	392.05	1568.62	500.33	935.00	990.00	1020.00	1065.00
Reach-1	58289.38 NEW	Natural	1020.64		1021.71	92.49	237.00	2136.26	87.75		990.16	1024.66	
Reach-1	58289.38 NEW	Floodway	1020.98	0.35	1021.91	85.00	255.33	2100.13	105.54	951.00	990.16	1024.66	1036.00
Reach-1	58351.73BR D	Natural	1022.98		1023.15	347.91	444.32	1668.48	348.11		990.00	1013.00	
Reach-1	58351.73BR D	Floodway	1023.41	0.42	1023.92	85.00	282.78	1885.94	289.87	951.00	990.00	1013.00	1036.00
Reach-1	58351.73BR U	Natural	1022.98		1023.15	376.96	444.32	1668.48	348.11		990.00	1013.00	
Reach-1	58351.73BR U	Floodway	1023.41	0.42	1023.92	101.00	282.78	1885.94	289.87	951.00	990.00	1013.00	1052.00
Reach-1	58415.23	Natural	1022.98		1023.15	418.54	918.73	985.50	556.78		993.10	1012.70	
Reach-1	58415.23	Floodway	1023.41	0.42	1023.92	101.00	514.43	1489.17	457.41	951.00	993.10	1012.70	1052.00
Reach-1	58519.71	Natural	1023.03		1023.90	142.20	376.76	1422.35	661.88		294.42	311.84	
Reach-1	58519.71	Floodway	1023.88	0.85	1024.50	100.00	426.10	1332.89	702.01	280.00	294.42	311.84	360.00
Reach-1	58693.98 NEW	Natural	1025.03		1025.36		273.78	632.02	677.16	1151.82	363.74	373.51	
Reach-1	58693.98 NEW	Floodway	1025.18	0.15	1026.02	100.00	635.25	946.14	879.61	330.00	363.74	373.51	430.00

Section VII
Scour Summary and Riprap Calculations

Proposed 100-yr



Hydraulic Design Data Contraction Scour

	Left	Channel	Right
Input Data			
Average Depth (ft):	0.71	9.50	2.61
Approach Velocity (ft/s):	1.38	15.65	3.31
Br Average Depth (ft):	7.71	14.69	4.68
BR Opening Flow (cfs):	1069.51	5271.49	548.00
BR Top WD (ft):	66.26	46.00	69.26
Grain Size D50 (mm):	0.37	0.37	0.37
Approach Flow (cfs):	8.01	6394.71	486.28
Approach Top WD (ft):	8.13	43.00	56.17
K1 Coefficient:	0.690	0.690	0.690
Results			
Scour Depth Ys (ft):	3.36	0.00	0.00
Critical Velocity (ft/s):	1.13	1.74	1.40
Equation:	Live	Live	Live

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape:	Square nose
Pier Width (ft):	3.00
Grain Size D50 (mm):	0.37000
Depth Upstream (ft):	14.79
Velocity Upstream (ft/s):	5.86
K1 Nose Shape:	1.00
Pier Angle:	30.00
Pier Length (ft):	12.00
K2 Angle Coef:	1.98
K3 Bed Cond Coef:	1.10
Grain Size D90 (mm):	0.47000
K4 Armouring Coef:	1.00

Set K1 value to 1.0 because angle > 5 degrees

Results

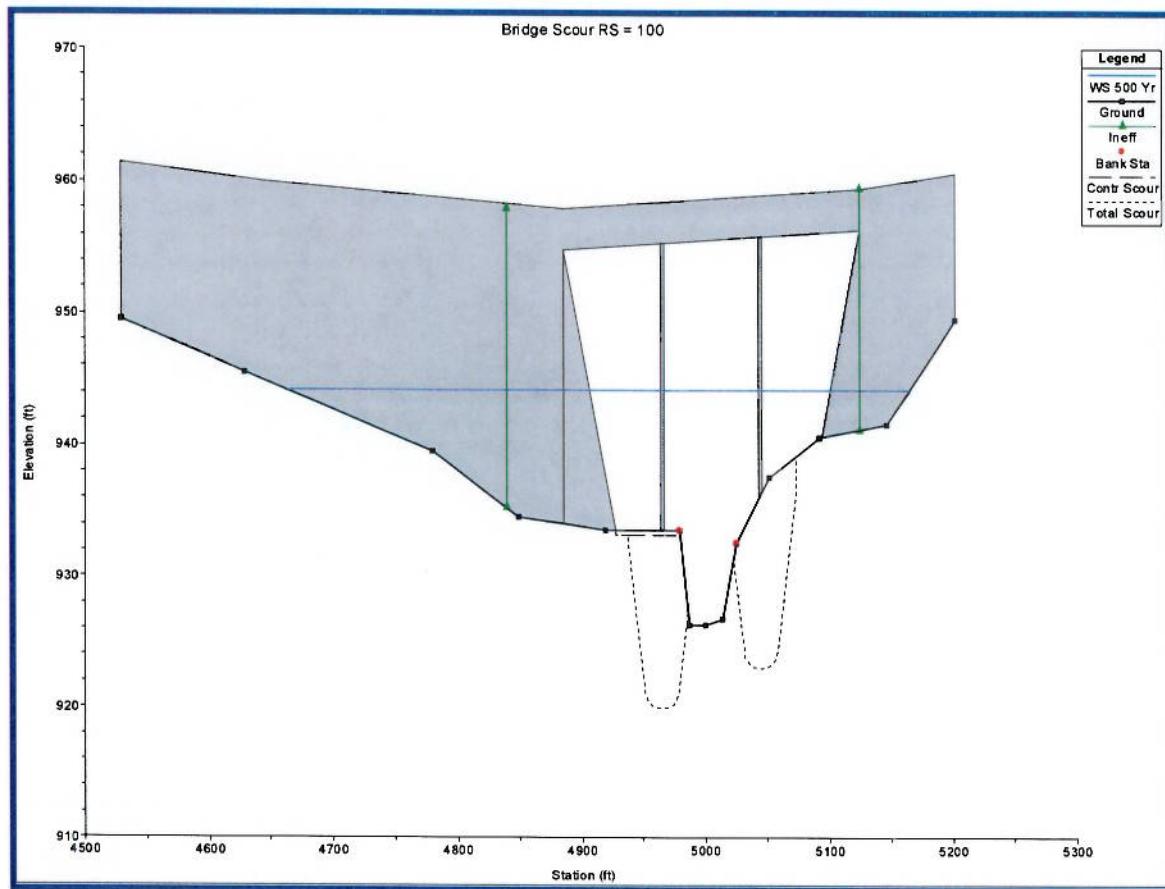
Scour Depth Ys (ft):	12.97
Froude #:	0.27
Equation:	CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft):

Left Bank:	16.3
Right Bank:	13.0

Proposed 500-yr



Hydraulic Design Data Contraction Scour

Input Data	Left	Channel	Right
Average Depth (ft):	1.52	11.11	3.42
Approach Velocity (ft/s):	2.09	15.82	3.61
Br Average Depth (ft):	9.03	16.44	6.17
BR Opening Flow (cfs):	1414.11	6258.69	846.20
BR Top WD (ft):	69.77	46.00	72.77
Grain Size D50 (mm):	0.37	0.37	0.37
Approach Flow (cfs):	54.90	7557.44	906.66
Approach Top WD (ft):	17.34	43.00	73.50
K1 Coefficient:	0.690	0.690	0.690

Results

Scour Depth Ys (ft):	0.38	0.00	0.00 Use 1 ft Min.
Critical Velocity (ft/s):	1.28	1.79	1.47
Equation:	Live	Live	Live

Lower scour than 100 yr storm?

Pier Scour

All piers have the same scour depth

Input Data

Pier Shape: Square nose

Pier Width (ft): 3.00

Grain Size D50 (mm): 0.37000

Depth Upstream (ft): 16.61

Velocity Upstream (ft/s): 5.95

K1 Nose Shape: 1.00

Pier Angle: 30.00

Pier Length (ft): 12.00

K2 Angle Coef: 1.98

K3 Bed Cond Coef: 1.10

Grain Size D90 (mm): 0.47000

K4 Armouring Coef: 1.00

Set K1 value to 1.0 because angle > 5 degrees

Results

Scour Depth Ys (ft): 13.27

Froude #: 0.26

Equation: CSU equation

Combined Scour Depths

Pier Scour + Contraction Scour (ft): 14.3

RIPRAP CALCULATIONS

*NH000-0073-03(242) Cobb County
I-75 over Noonday Creek
PI # 714130*

ENDROLL RIPRAP CALCULATIONS (100 YEAR STORM)
METHOD IN HEC-18,"EVALUATING SCOUR AT BRIDGES"

BRIDGE ABUTMENT LOCATION	839+37	841+79.25
SET BACK LENGTH =	66	52
MAIN CHANNEL AREA @ BRIDGE =	664	664
TOP WIDTH OF MAIN CHANNEL @ BRIDGE =	46	46
AVERAGE DEPTH OF MAIN CHANNEL @ BR =	14.4	14.4
SET BACK RATIO =	4.583	3.611
CHARACTERISTIC AVG VELOCITY CALCULATIONS (SEE PAGES 120,121)		
DISCHARGE @ ABUTMENT =	454	1286
AREA @ ABUTMENT =	289	590
AVERAGE VELOCITY, V =	1.57	2.18
AREA OF OVERBANK FLOW @ BRIDGE =	289	590
LENGTH OF OVERBANK FLOW @ BRIDGE =	66	52
AVERAGE DEPTH OF OVERBANK FLOW =	4.38	11.35
FROUDE NUMBER =	0.132	0.114
IF FROUDE NUMBER <= 0.80, THEN D50 =	0.041	0.080
IF FROUDE NUMBER > 0.80, THEN D50 =	0.919	2.284
MEDIAN STONE DIAMETER REQUIRED, D50 =	0.041	0.080
TYPE OF RIPRAP REQUIRED =	TYPE 3	TYPE 3

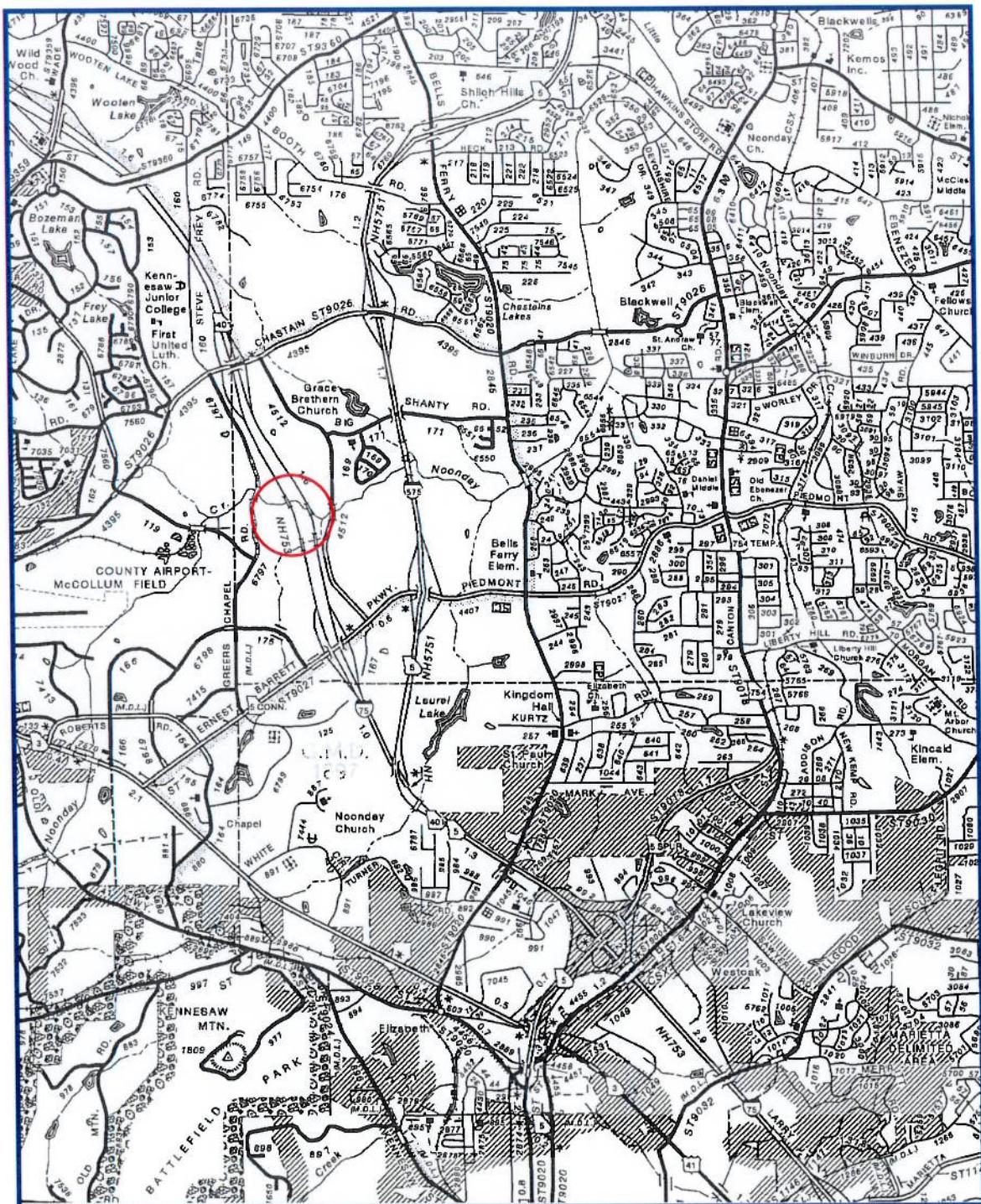
Note : Type I Riprap will be used at this site.

HEC-RAS Plan: Proposed River, Noonday Creek Reach: 1 Profile: 100 Yr

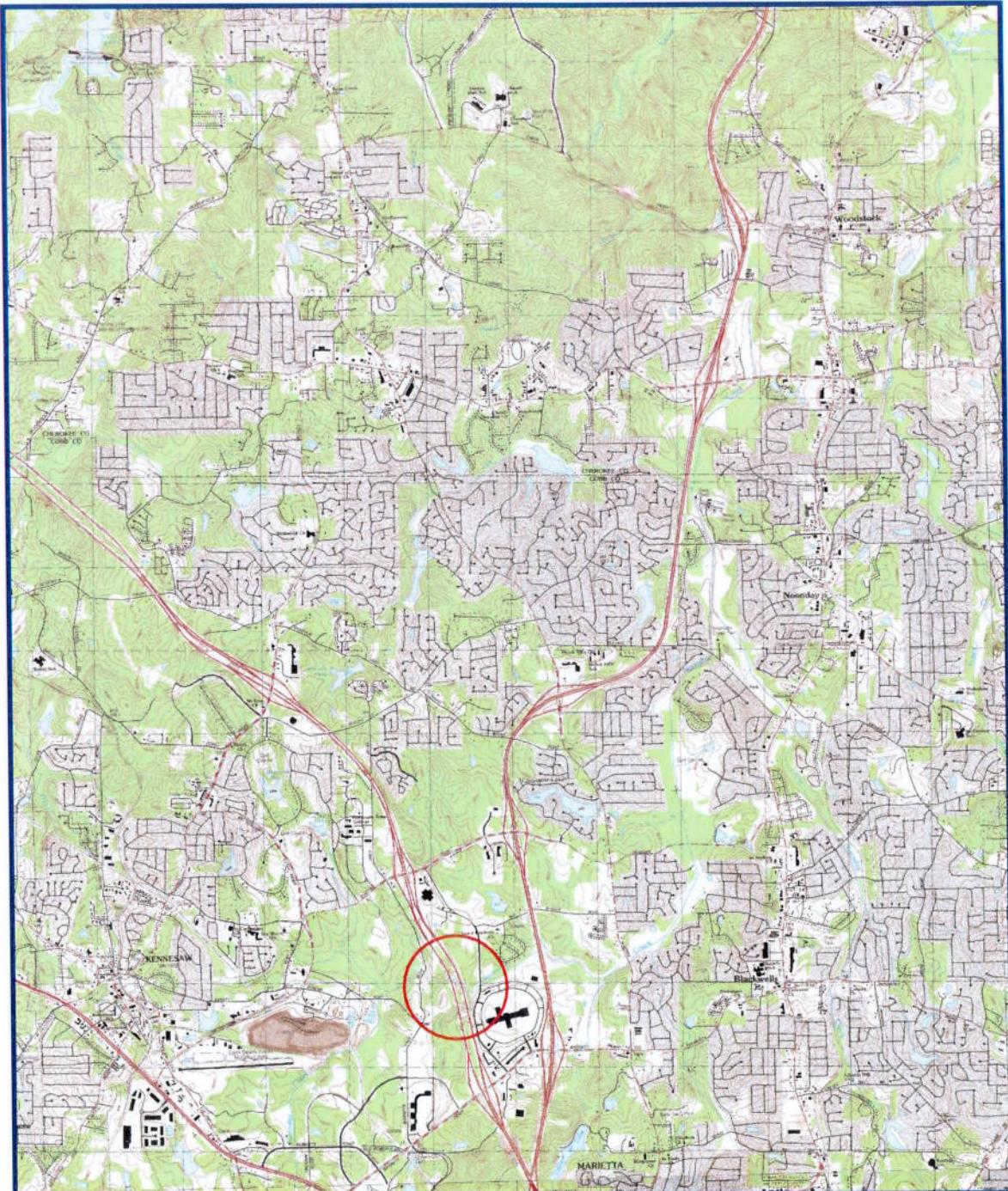
Reach	River Sta	Profile	W.S. Elev (ft)	Hyd Depth L (ft)	Hyd Depth C (ft)	Hyd Depth R (ft)	Top W Left (ft)	Top W Chnl (ft)	Top W Right (ft)	Q Left (cfs)	Q Channel (cfs)	Q Right (cfs)	Flow Area L (sq ft)	Flow Area Ch (sq ft)	Flow Area R (sq ft)	
1	-630	100 Yr	940.63	6.42	6.84	14.47	96.25	46.00	60.35	1293.66	4704.04	891.30	617.55	665.53	412.75	
1	0	100 Yr	942.49	9.02	14.83	4.21	269.98	46.00	147.28	2032.78	4332.60	523.62	910.98	682.38	391.19	
1	100	BR D	942.55	8.04	14.43	4.63	73.46	46.00	62.46	1286.15	5149.08	453.78	590.48	663.74	289.40	
1	100	BR U	942.45	7.71	14.69	4.68	66.26	46.00	69.26	1068.51	5271.49	548.00	510.93	675.52	324.16	
1	246	100 Yr	943.02	8.68	14.79	4.00	275.44	46.00	129.00	2429.93	3985.51	478.56	1206.53	680.50	400.36	
1	395	100 Yr	941.02	0.71	9.50	2.61	8.13	43.00	56.17	8.01	6394.71	486.28	5.79	408.56	146.70	
1	590	100 Yr	946.59	6.80	14.86	6.93	98.10	43.00	70.12	1258.41	4596.75	1043.84	591.33	639.12	486.26	
1	690	BR D	946.74	6.83	14.69	6.75	67.28	43.00	66.43	967.42	4967.95	963.63	459.65	631.80	448.27	
1	690	BR U	100 Yr	946.60	8.37	16.40	7.29	72.04	38.00	68.51	1214.24	4687.48	987.28	603.34	623.37	499.70
1	790	100 Yr	946.91	8.11	16.39	7.37	105.38	38.00	71.45	1583.59	4282.31	1043.11	746.12	622.87	526.81	
1	1280	100 Yr	947.96	6.82	16.75	7.48	127.34	43.00	60.79	1642.56	4394.69	851.76	868.75	720.36	454.80	

Section VIII
Appendix

LOCATION MAPS



NH000-0073-03(242) Cobb County
I-75 over Noonday Creek
PI# 714130



**NH000-0073-03(242) Cobb County
I-75 over Noonday Creek
PI# 714130**



**NH000-0073-03(242) Cobb County
I-75 over Noonday Creek
PI# 714130**

PROJECT PHOTOGRAPHS



Looking south along the upstream side of the northbound bridge.



Looking south along the upstream side of the northbound bridge.



Looking north along the upstream side of the northbound bridge.



Looking north along the upstream side of the northbound bridge. (flooding Sept. '09)



Looking north along the upstream side of the northbound bridge.



Looking east at the northern end of the northbound bridge. Note Manholes.



Looking at the northwest corner of the northbound bridge (upstream).



Looking at the southwest corner of the northbound bridge (upstream).



Looking upstream from the northbound bridge.



Looking downstream from the northbound bridge.



Looking downstream from the northbound bridge.



Looking upstream from the downstream structure on George Busbee Parkway.



Looking downstream from the downstream bridge on George Busbee Parkway.



Looking north along the upstream side of the downstream bridge.



Looking south along George Busbee Parkway (downstream bridge).

FEMA DATA

TABLE 2 - SUMMARY OF DISCHARGES (continued)

<u>Flooding Source and Location</u>	Drainage Area (square miles)	Peak Discharges (cubic feet per second)				
		10-Percent- Annual-Chance	2-Percent- Annual-Chance	1-Percent- <u>Annual-Chance</u>		0.2-Percent- Annual-Chance
				<u>Existing</u>	<u>Future</u>	
MUD CREEK (continued)						
At Villa Rica Road	6.80	2,728	4,177	4,628	5,154	5,960
At West Sandtown Road						
Southwest	5.30	1,869	3,101	3,485	3,815	4,327
At Old Dallas Road Southwest	4.40	1,869	3,101	3,485	3,815	4,327
At Burnt Hickory Road						
Southwest	1.50	908	1,402	1,608	1,828	2,049
NICKAJACK CREEK						
At confluence with						
Chattahoochee River	35.9	10,520	17,320	20,640	21,650	28,910
Approximately 190 feet						
upstream of Old Cooper Lake						
Road Southeast	20.78	8,160	13,690	16,298	16,970	23,060
Approximately 220 feet						
upstream of Concord Road	14.56	6,370	10,100	11,840	12,250	16,400
Approximately 1,330 feet						
upstream of Hurt Road						
Southeast	8.44	5,160	7,810	8,880	9,020	11,720
Approximately 250 feet						
upstream of Church Road						
Southeast	5.99	4,770	6,970	7,830	7,950	10,250
Approximately 550 feet						
upstream of Smyrna Powder						
Springs Road Southeast	2.68	2,520	3,940	4,580	4,700	6,170
Approximately 220 feet						
upstream of South Cobb						
Drive Southeast/State						
Highway 280	0.62	440	650	740	740	970
NOONDAY CREEK						
At Shallowford Road Northeast						
(Downstream)	34.40	9,842	14,758	16,834	16,834	21406
At Hawkins Store Road						
Northeast (Upstream)	25.20	8,668	12,720	14,423	14,423	17,723
At New Chastain Road						
Northeast	22.40	8,843	12,834	14,652	14,652	17,605
At Bells Ferry Road Northeast	17.60	6,430	9,681	11,110	11,110	12,936
At Barrett Lakes Boulevard						
Northwest	10.80	5,365	7,471	8,534	8,534	10,964
At Duncan Road	7.80	3,507	4,917	5,480	5,480	6,451
At Roberts Boulevard						
Northwest	5.80	2,804	4,290	4,732	4,732	5,823

FLOODING SOURCE		FLOODWAY			BASE FLOOD SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Noonday Creek								
A	3,153	330	2,919	5.8	897.8	897.8	898.6	0.8
B	4,577	225	3,026	5.6	901.6	901.6	901.9	0.3
C	4,754	140	1,950	8.6	902.0	902.0	902.3	0.3
D	4,959	287	4,129	4.2	904.2	904.2	904.4	0.2
E	5,487	610	8,290	2.1	905.0	905.0	905.2	0.2
F	5,940	736	9,115	1.9	905.1	905.1	905.4	0.3
G	7,286	460	5,008	3.5	905.3	905.3	905.8	0.5
H	8,446	290	3,171	5.5	906.1	906.1	906.9	0.8
I	9,298	187	2,565	5.6	911.1	911.1	911.3	0.2
J	10,401	285	4,318	3.3	912.9	912.9	913.1	0.2
K	11,700	297	4,642	3.1	914.2	914.2	914.5	0.3
L	13,462	520	8,347	1.7	914.7	914.7	915.2	0.5
M	14,756	680	8,455	1.7	914.9	914.9	915.5	0.6
N	16,295	750	10,243	1.4	915.1	915.1	916.0	0.9
O	17,748	550	5,140	2.9	918.2	918.2	918.7	0.5
P	18,652	390	3,760	3.9	919.0	919.0	920.0	1.0
Q	20,341	400	3,886	3.8	922.1	922.1	922.9	0.8
R	22,221	800	7,381	1.5	924.3	924.3	925.2	0.9
S	23,477	200	2,520	4.7	927.6	927.6	928.1	0.5
T	24,584	260	3,414	3.5	929.1	929.1	929.6	0.5
U	24,943	430	4,820	2.5	929.7	929.7	930.3	0.6
V	26,158	345	3,525	3.4	930.7	930.7	931.2	0.5
W	27,925	116	1,206	9.9	933.4	933.4	934.3	0.9
X	28,276	175	1,446	8.2	934.9	934.9	935.3	0.4
Y	29,655	500	5,332	2.2	940.9	940.9	941.1	0.2
Z	31,354	100	1,323	9.0	942.1	942.1	943.1	1.0

¹1,965 feet below county boundary

FEDERAL EMERGENCY MANAGEMENT AGENCY
**COBB COUNTY, GA
AND INCORPORATED AREAS**

FLOODWAY DATA

NOONDAY CREEK

TABLE 6

FLOODING SOURCE		FLOODWAY			BASE FLOOD WATER-SURFACE ELEVATION (FEET NAVD)			
CROSS SECTION	DISTANCE ¹	WIDTH (FEET)	SECTION AREA (SQUARE FEET)	MEAN VELOCITY (FEET PER SECOND)	REGULATORY	WITHOUT FLOODWAY	WITH FLOODWAY	INCREASE
Noonday Creek (continued)								
AA	33,046	120	1,562	4.7	947.9	947.9	948.2	0.3
AB	34,320	223	2,873	3.0	952.3	952.3	952.6	0.3
AC	35,731	390	4,580	1.9	953.1	953.1	953.6	0.5
AD	37,049	135	1,504	3.7	954.3	954.3	955.1	0.8
AE	38,163	470	5,097	1.1	955.8	955.8	956.6	0.8
AF	39,458	100	782	7.0	955.8	955.8	956.8	1.0
AG	41,077	130	1,918	2.9	959.9	959.9	960.5	0.6
AH	42,778	300	1,892	2.9	961.1	961.1	961.7	0.6
AI	44,309	150	832	5.2	963.5	963.5	964.3	0.8
AJ	45,690	121	878	3.2	969.9	969.9	969.9	0.0
AK	45,869	121	870	3.3	971.1	971.1	971.0	0.0
AL	46,822	130	813	3.8	973.3	973.3	974.1	0.8
AM	48,221	167	733	4.2	976.4	976.4	976.8	0.4
AN	49,848	220	1,407	1.7	982.5	982.5	982.7	0.2
AO	51,158	116	486	5.0	984.4	984.4	985.1	0.7
AP	52,150	150	458	5.3	989.1	989.1	989.4	0.3
AQ	53,909	60	261	2.9	994.9	994.9	995.5	0.6
AR	54,470	67	1,195	0.6	1,014.6	1,014.6	1,014.6	0.0
AS	55,789	220	2,507	1.0	1,014.7	1,014.7	1,014.7	0.0
AT	57,643	150	962	2.6	1,018.7	1,018.7	1,019.2	0.5
AU	58,694	100	497	5.0	1,025.0	1,025.0	1,025.2	0.2

¹1,965 feet below county boundary

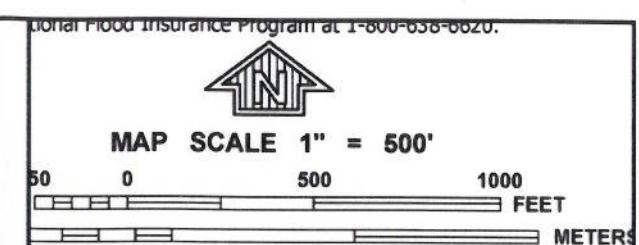
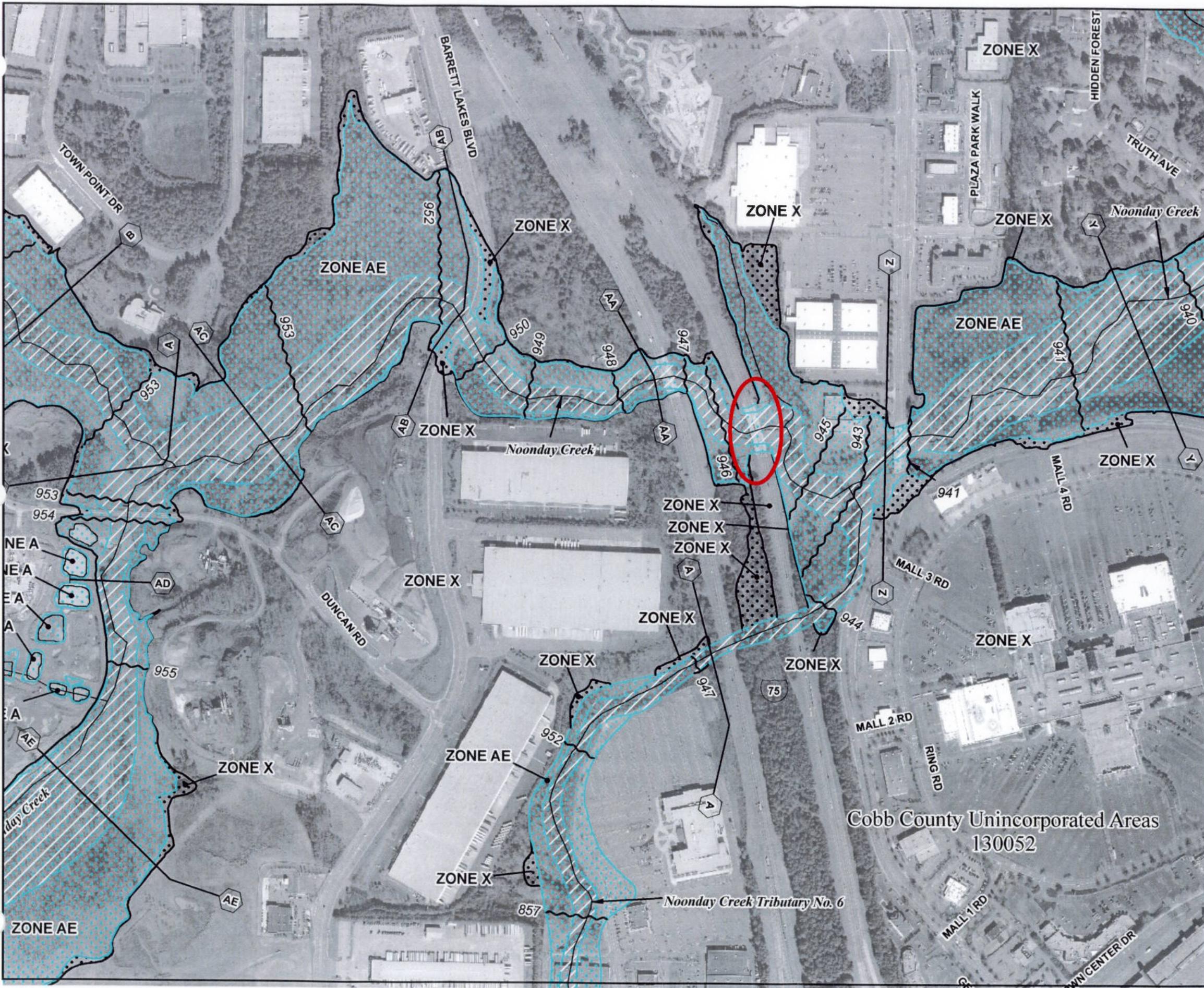
**COBB COUNTY, GA
AND INCORPORATED AREAS**

FEDERAL EMERGENCY MANAGEMENT AGENCY

TABLE 6

FLOODWAY DATA

NOONDAY CREEK



NFIP

PANEL 0039G

FIRM
FLOOD INSURANCE RATE MAP

COBB COUNTY,
GEORGIA
AND INCORPORATED AREAS

PANEL 39 OF 252
(SEE MAP INDEX FOR FIRM PANEL LAYOUT)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
COBB COUNTY KENNESAW CITY OF	130052	0039	G
	130055	0039	G

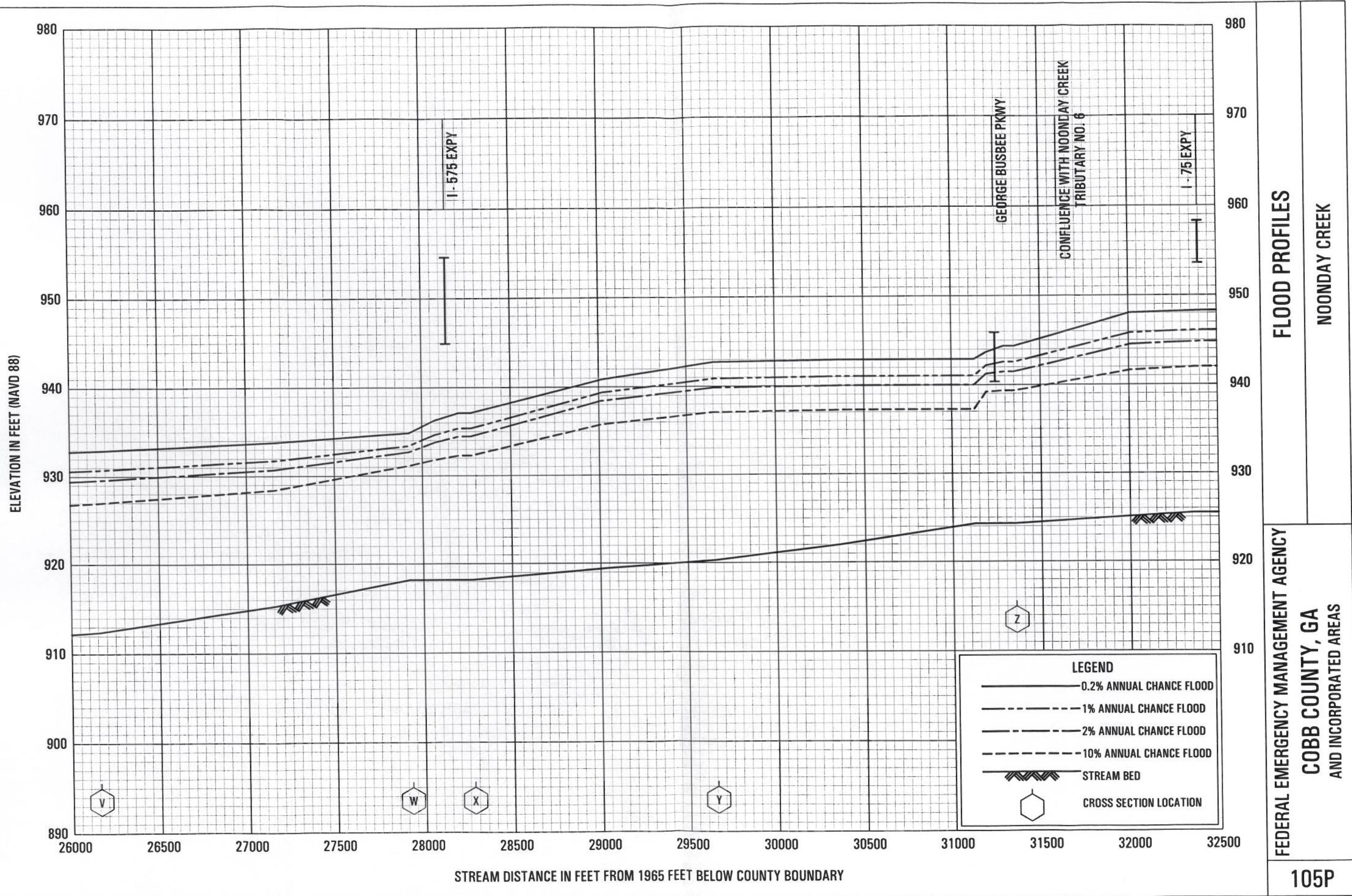
Notice to User: The Map Number shown below should be used when placing map orders; the Community Number shown above should be used on insurance applications for the subject community.

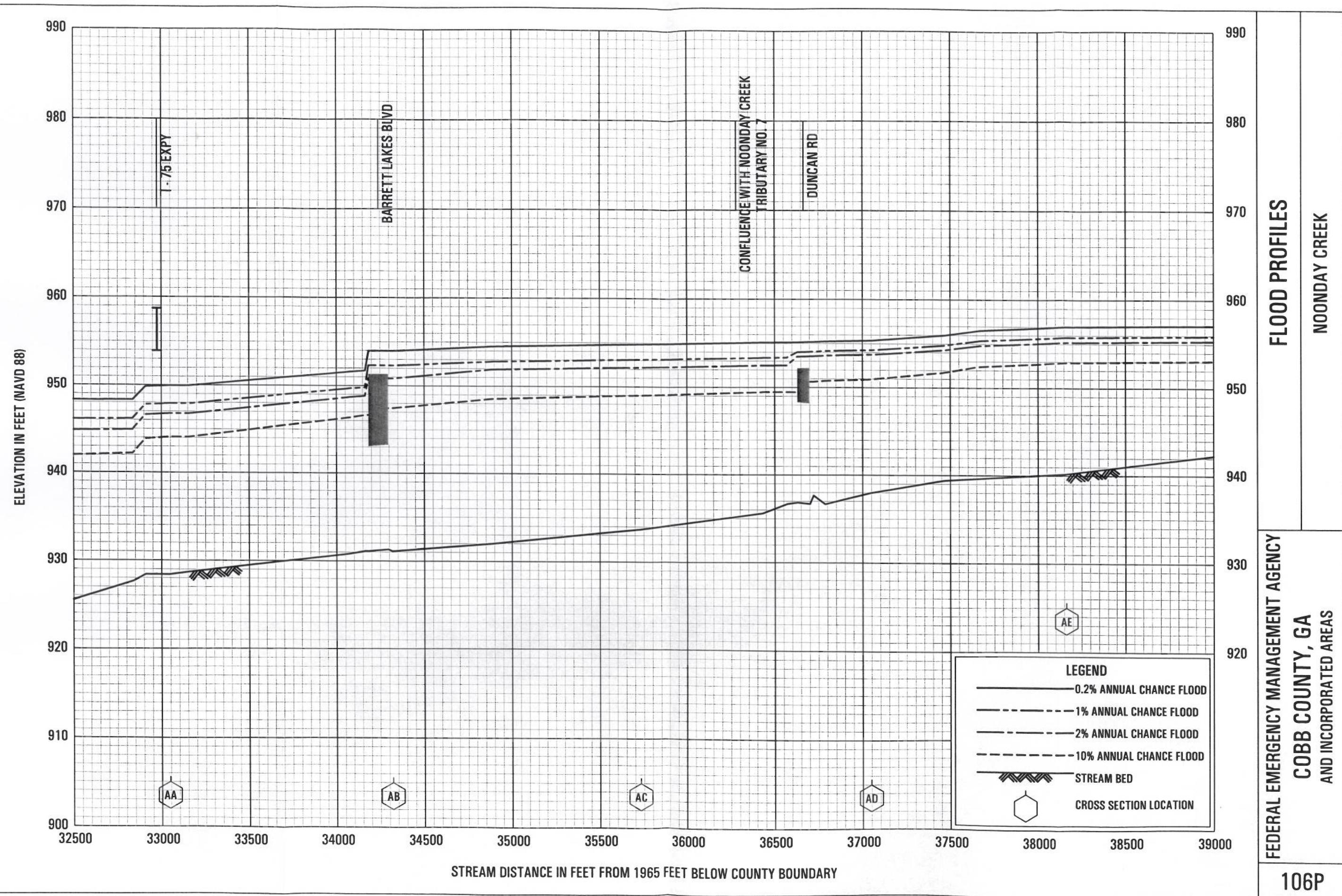
MAP NUMBER
13067C0039G

MAP REVISED
DECEMBER 16, 2008

Federal Emergency Management Agency

This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msfc.fema.gov





MISCELLANEOUS PROJECT DATA

John McWhorter

From: Crampton, Sam [scrampton@Dewberry.com]

Sent: Tuesday, April 29, 2008 6:09 PM

To: John McWhorter

Subject: RE: Cobb and Cherokee FEMA models

Thanks for the surveys. I will keep them handy for any updates we do. I will take a look at the USGS comments. The problem we find with the regression flows is that they are out of date and do not do well for urbanized area or for future flows. I certainly would not rule out the models over estimating. Unfortunately there has not been the funding for us to revise the hydrology completely on any studies except Pitner Creek and so they are all old HEC1 models that have simply had the curve numbers updated.

The next few weeks is really busy but after that we could meet for lunch.

Sam Crampton
Water Resources Engineer
Dewberry
2872 Woodcock Blvd, Suite 230
Atlanta, Ga 30341
678-530-0022 x203
678-530-0044 (fax)

From: John McWhorter [mailto:jmcwhorter@JBTrimble.com]

Sent: Tuesday, April 29, 2008 2:45 PM

To: Crampton, Sam

Cc: Robbie Frizzell; Beck, Susan

Subject: RE: Cobb and Cherokee FEMA models

Sam,

Here are the recent bridge surveys for the I-575 over Noonday Creek crossings. Hopefully this will be of use to you.

I noticed that there is a large difference between the FEMA discharges and the USGS regression flows. Since we will model the proposed construction with the FEMA model and our own HEC-RAS model using the project survey and our calculated discharges, I'm in the process of trying to resolve this difference. I presented this info to the USGS and asked for guidance. I've attached that email exchange here with hopes that you would read this over and comment as well.

Our May calendar is pretty full but Robbie and I want to take you to lunch soon to talk about projects and to say thanks for all your help over the past year or so.

Thanks again for you help!

John

From: Crampton, Sam [mailto:scrampton@Dewberry.com]

Sent: Friday, April 18, 2008 8:41 AM

To: John McWhorter

Subject: RE: Cobb and Cherokee FEMA models

I hope you got some sleep, I see the email was sent at 2:52AM!

I have the new model for Noonday which will become effective Dec 26 08. We have a project in the vicinity of I-575 and 75 on Noonday Creek and will likely be making a FEMA submittal. I know that the bridge survey in that area is very old and poor quality and really does need to be updated. If you have existing conditions survey for any of them structures around there, please could you le us with them to update the model.

DEC08 Hydrology HEC1 model that will become effective for Noonday Creek in DEC 08

DEC08 Model RAS model for Noonday creek that will become effective in DEC08

Effective 92 Models These should be the Noonday and Tate models that went effective in 92. Check carefully to ensure that

5/25/2008

They are the models if you need to use them.

Incomplete Tate Revisions This model is one that we tried to use (performed by another consultant) but we found problems with it and had to stick with the effective data for Tate Creek. We made some changes to this but gave up half way through because it would have cost too much to redo the model (I think it was mainly hydrology issues). There may be things you could use from this.

The zip with these files in can be downloaded from our ftp.

File: newberry.com

Login: CobbGA

Swd: S4RRWQ

Sam Crampton
Water Resources Engineer
newberry
872 Woodcock Blvd, Suite 230
Atlanta, Ga 30341
78-530-0022 x203
78-530-0044 (fax)

From: John McWhorter [mailto:jmcwhorter@JBTrimble.com]

Sent: Friday, April 18, 2008 2:52 AM

To: Crampton, Sam

Cc: Robbie Frizzell

Subject: Cobb and Cherokee FEMA models

Sam,

Once again, I'm coming to you for some FEMA models. We are working on costing plans for a major construction project along I-575 in Cobb and Cherokee Counties. The floodways encountered along this corridor are Noonday Creek, Tate Creek and Little River. I've requested the data through Michael Baker also, but the Cobb County data has an effective date of August 18, 1992. I know there is a preliminary revised DFIRM for Cobb County. We want to get the latest data, especially if the revised effective date is imminent.

Any information you can provide along these streams in Cobb and Cherokee Counties will be much appreciated.

Thanks,

John McWhorter, P.E.

J.B. Trimble, Inc.

770-200-1713 direct

770-952-1022 office

770-952-1041 fax

jmcwhorter@jbtrimble.com

John McWhorter

From: Anthony J Gotvald [agotvald@usgs.gov]
Subject: Monday, April 28, 2008 9:57 AM
To: John McWhorter
Cc: Garrick L. Edwards; Larry Cook; Robbie Frizzell; Curtis, Steven; Beck, Susan
Subject: RE: Noonday Creek Discharges - I-575

John,

Do you know of any websites that explain the FEMA modeling in general. I am not very familiar with the FEMA modeling and would like to learn more. I am more familiar with the HEC modeling, and I would not mind looking at the HEC-1 model if it is not too much trouble to put it on an ftp site. As a rule of thumb, the rural equations can be used for sites that have impervious area less than 10 percent. 10-15% is kind of a grey area, and anything above 15% is definitely affected by urbanization and the urban equations should be used. If there is anyway you can calculate the impervious area for these sites, then I strongly recommend doing so. With the information that is available, I would recommend using the urban equations for both the 12.8 and 43.2 sq. mi sites. The impervious area is more than likely greater than 10 % and is only going to increase, so the urban equations would be more applicable. Of course, the 43.2 sq miles is out of the range of the urban equations, but if the impervious area is above 10% then this site is beyond the limitations of the rural equations as well. We are actually in the process of putting together a proposal to update the urban equations. We plan to use a multi-state approach where we would pool together urban sites from VA, TN, NC, SC, GA, AL and FL. This way the ranges in drainage areas would increase for the urban equations. We are finishing up a similar multi-state approach for the rural equations. The new rural equations will be out at the end of the calendar year. As for the 2005 peaks for both 02392975 and 02392950, keep in mind those peaks have an accuracy of +/- 5 percent. So this is the reason for the slight difference (-2 percent). These sites are very close together and there is no major inflows between them, so the values of the two peaks are almost the same value if you consider the 10 percent uncertainty range.

Tony Gotvald, Hydrologist
U.S. Geological Survey
367 Amwiler Road, Suite 130
Atlanta, GA 30360
(770) 903-9310

"John McWhorter" <jmcwhorter@JBTrimble.com>

04/26/2008 09:57 PM

To "Anthony J Gotvald" <agotvald@usgs.gov>

cc "Garrick L. Edwards" <gledwards@JBTrimble.com>, "Larry Cook" <lcook@JBTrimble.com>, "Robbie Frizzell" <rfrizzell@JBTrimble.com>, "Curtis, Steven" <ssacurtis@bechtel.com>, "Beck, Susan" <sbeck@dot.ga.gov>

Subject RE: Noonday Creek Discharges - I-575

Thanks Tony. I agree that the FEMA flows seem high for the 12.8 square mile area. Since they are in the regulatory model, we are probably stuck with them for the FEMA modeling. However, for projects that are reviewed by GDOT, we develop a separate HEC-RAS model using the project survey and our calculated discharges.

Using an impervious area of 15% for the Southern Noonday Creek crossing (12.8 sq mi) the Q100 = 7012 cfs, which equates to about 60% of the FEMA flow. For the northern Noonday crossing (43.2 sq mi), the 15% impervious area generates a Q100 = 1623 cfs which is much greater than the FEMA flow. As you know, this drainage area size is outside of the range of use for the urban equations. Although Tim Stamey once told me that the urban equations could be used outside of their recommended range (standard error just won't apply), they may be excessive in this case. The rural equations here produce a Q100 = 9108 cfs.

Based on a 15% impervious area at the Hawkins Store Road gage (02392950), the 2005 event (6470 cfs) produced a 10 year storm peak of 10,000 cfs.

along Noonday Creek (10 yr @ 15% imp = 6674 cfs). An interesting point to note is that the downstream Shallowford Road gage (02392975, DA = 33.6 sq mi) recorded a lower discharge for the same flood event in 2005.

Would you agree that using 15% +/- impervious and the urban equations for the 12.8 square mile site and just the rural equations for the 43.2 square mile site is a reasonable approach to the discharges for these sites?

There is a HEC-1 model. I can provide this to you if you would like. It's probably too big for email (5 meg) so let me know and I'll post it to our ftp site.

I really appreciate your help with this. This is a hot project and determining reasonable discharges for these sites is critical. This is particularly the case with the northern Noonday crossing since that bridge will likely be jacked to address a clearance issue.

Thanks again,

John

From: Anthony J Gotvald [mailto:agotvald@usgs.gov]
Sent: Fri 4/25/2008 2:44 PM
To: John McWhorter
Cc: Garrick L. Edwards; Larry Cook; Robbie Frizzell; Curtis, Steven; Beck, Susan
Subject: Re: Noonday Creek Discharges - I-575

John,

The Q100 values of 11,917 and 12,874 cfs at the I-575 crossing seem high for a drainage area of only 12.8 square miles. Are the data used for these FEMA analyses available? It would be interesting to see the data that were used in the analysis. I am a little confused on the study dates you mentioned. Cherokee County had a study done in 1988 and then 2006, and Cobb County had a study done in 1992 and then in 2008. Is this correct? Do any of these recent studies include the large event that occurred in July of 2005? I would estimate that the % impervious area for the Noonday Creek watershed is somewhere between 5-15%. Between the rural and urban equations, the urban equations would serve as a better estimate of the Q100 for this site. However, these FEMA studies may have additional information that would lead to a better estimate of the Q100 for this site.

Tony Gotvald, Hydrologist
USGS Georgia Water Science Center
3039 Amwiler Road, Suite 130
Atlanta, GA 30360
(770) 903-9310

"John McWhorter"
<jmcwhorter@JBTrimble.com>

04/25/2008 11:38 AM

To <agotvald@usgs.gov>
cc "Robbie Frizzell" <rfrizzell@JBTrimble.com>, "Beck, Susan" <sbeck@dot.ga.gov>, "Garrick L. Edwards" <gledwards@JBTrimble.com>, "Larry Cook" <lcook@JBTrimble.com>, "Curtis, Steven" <sacurtis@bechtel.com>
Subject Noonday Creek Discharges - I-575

Tony,

We are working on plans to widen I-575 over two crossings of Noonday Creek, which flows from south to north in Cobb and

5/25/2008

Cherokee Counties. The southern crossing is in Cobb County and the northern crossing is in Cherokee county. Since Noonday Creek is a FEMA studied stream, I was comparing discharges between the regression equations and FEMA and due to the large differences, I would like to get your comments.

The Cherokee County FEMA study is dated September 29, 2006. It appears that the discharges used for Noonday Creek in this study remain unchanged from the original study done in 1988. There is a "preliminary" study for Cobb County that is slated for a December 2008 effective date. This study includes new hydrology for Noonday Creek and the discharges are ~2.5 times the rural regression equations. This area is certainly urbanized and the use of the urban regression equations is easily warranted. However, even an impervious area of 100% will not approach the FEMA flows. At the southern (Cobb County) crossing of I-575 over Noonday Creek, the drainage area is 12.8 square miles. The USGS rural Q100 = 4468 cfs and the Dec. '08 FEMA flow is 11917 cfs. With an impervious area of 100%, the USGS urban regression Q100 = 9681cfs. For reference, the previous 100 year FEMA flow from the 1992 study = 12874 cfs.

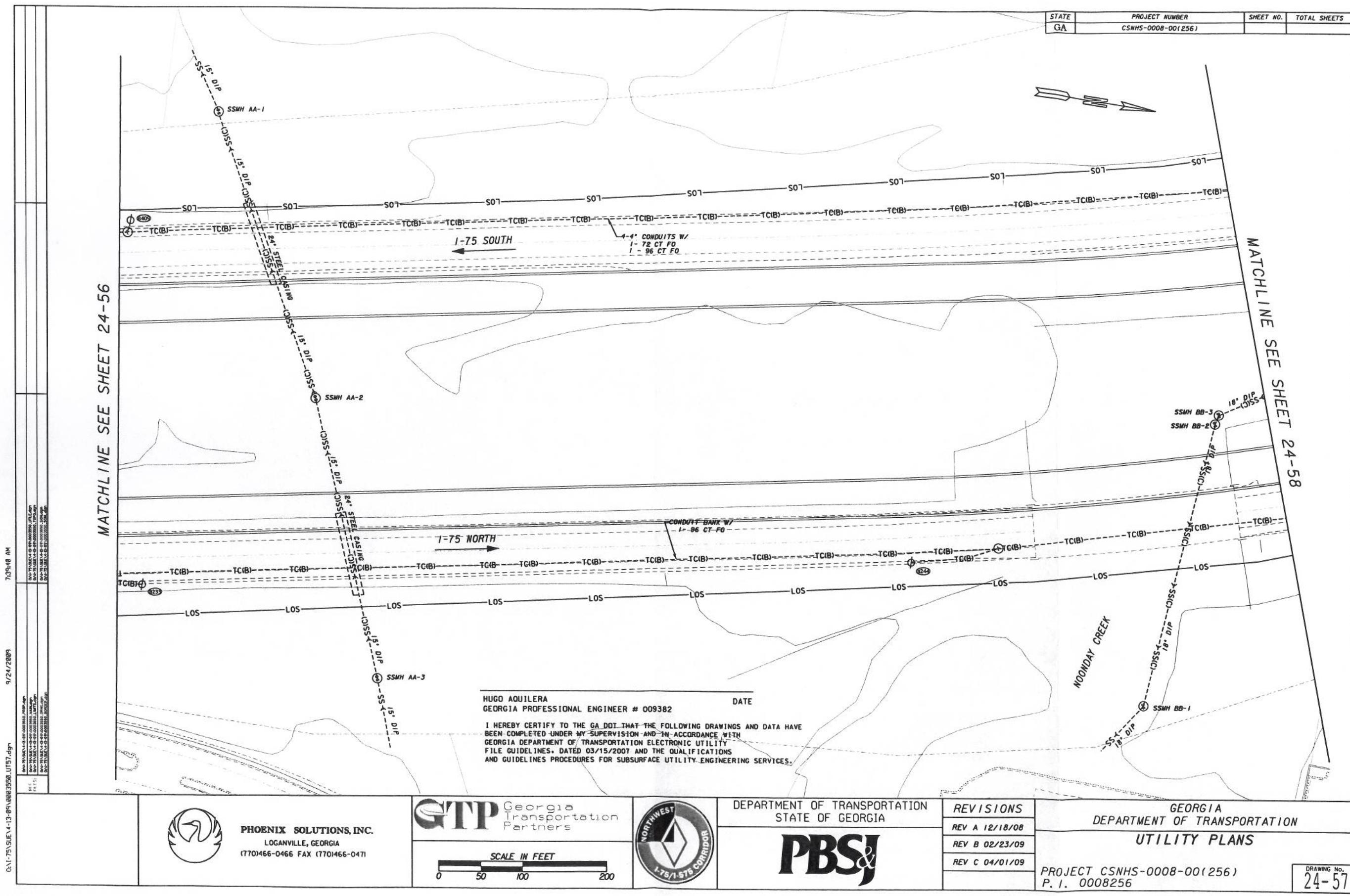
There are gages on Noonday Creek at Shallowford Road (02392975) and Hawkins Store Road (02392950), which are in the area at 33.6 and 24.3 square miles, respectively. However, these gages only have about seven years of record.

The northern I-575 crossing over Noonday Creek in Cherokee County has a drainage area of 43.2 square miles. The current 2006 Flood Insurance Study for Cherokee County has a 100 year discharge of 9372 cfs at the confluence with Little River (drainage area 49.3 square miles). The 100 year rural discharge is 9108 cfs at the bridge site (43.2 sq mi) and 9839 cfs at the confluence (49.2 sq mi). In this case, the discharges correlate fairly well between USGS and FEMA except that some urbanization should be considered

As you can see, the downstream crossing has ~3.4 times the drainage area (43.2 vs. 12.8) and approximately 75% of the discharge based on the FEMA flows. There appears to be some storage available between the two I-575 crossings over Noonday Creek that could partially explain the reduction. If you would, please comment on this issue and provide your recommendations for the discharge calculations for both the north and south crossings of I-575 over Noonday Creek. I've attached an excerpt from the quad map for your use.

Thank you for your time.

J... McWhorter, P.E.
J.B. Trimble, Inc.
770-200-1713 direct
770-952-1022 office
770-952-1041 fax
jmcwhorter@jbtrimble.com



SANITARY SEWER DATA

HUGO AQUILERA
GEORGIA PROFESSIONAL ENGINEER # 009382

DATE

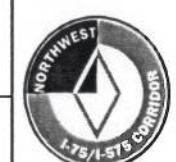
I HEREBY CERTIFY TO THE GA DOT THAT THE FOLLOWING DRAWINGS AND DATA HAVE BEEN COMPLETED UNDER MY SUPERVISION AND IN ACCORDANCE WITH GEORGIA DEPARTMENT OF TRANSPORTATION ELECTRONIC UTILITY FILE GUIDELINES, DATED 03/15/2007 AND THE QUALIFICATIONS AND GUIDELINES PROCEDURES FOR SUBSURFACE UTILITY ENGINEERING SERVICES.



PHOENIX SOLUTIONS, INC.
LOGANVILLE, GEORGIA
(770)466-0466 FAX (770)466-0471



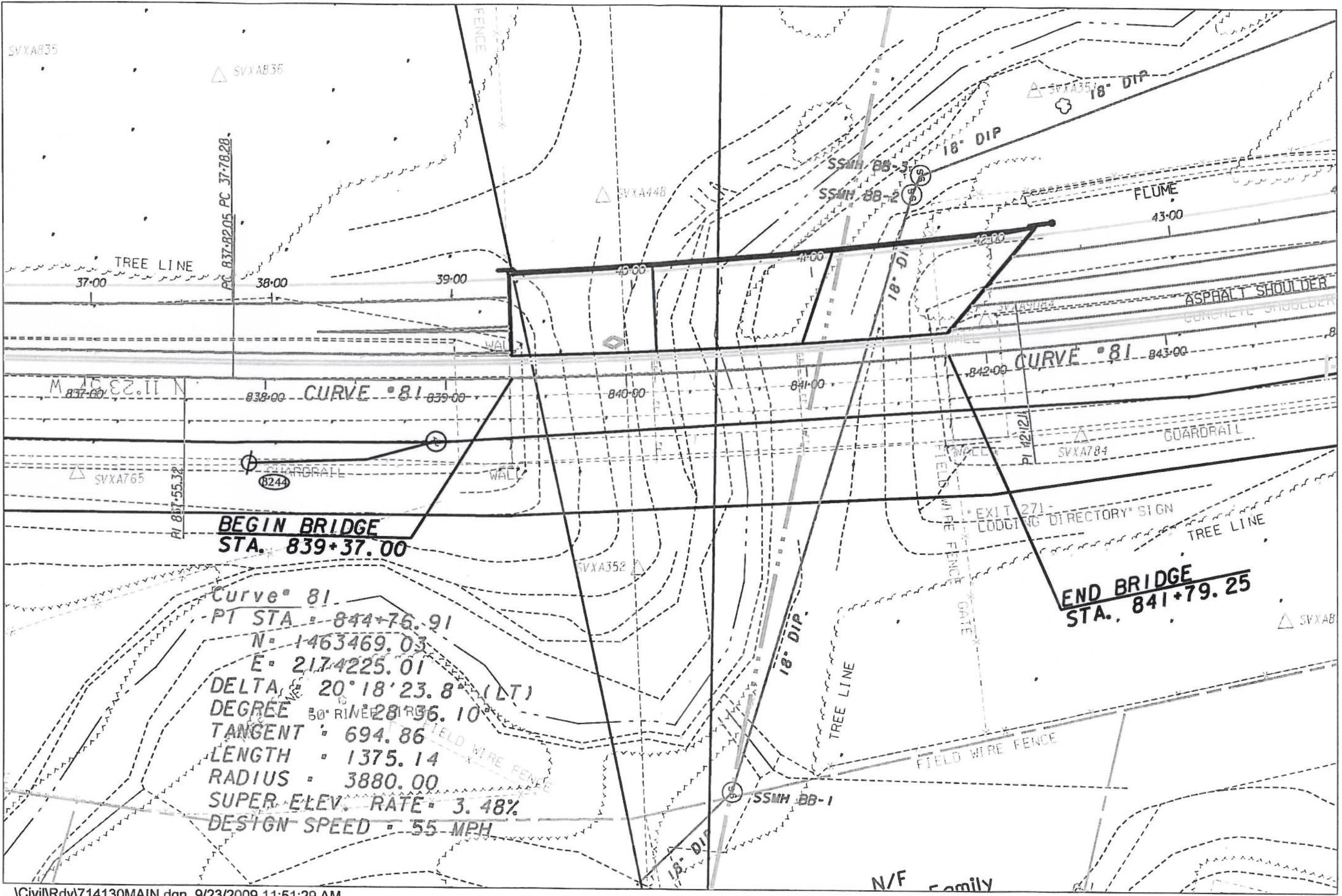
NOT TO SCALE

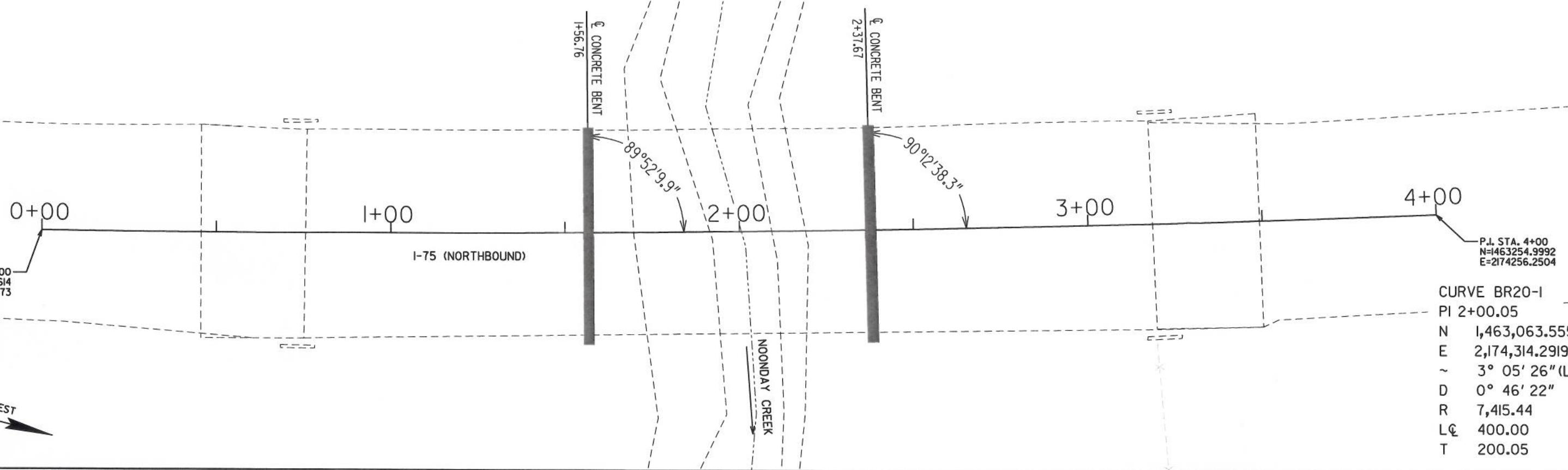


DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA



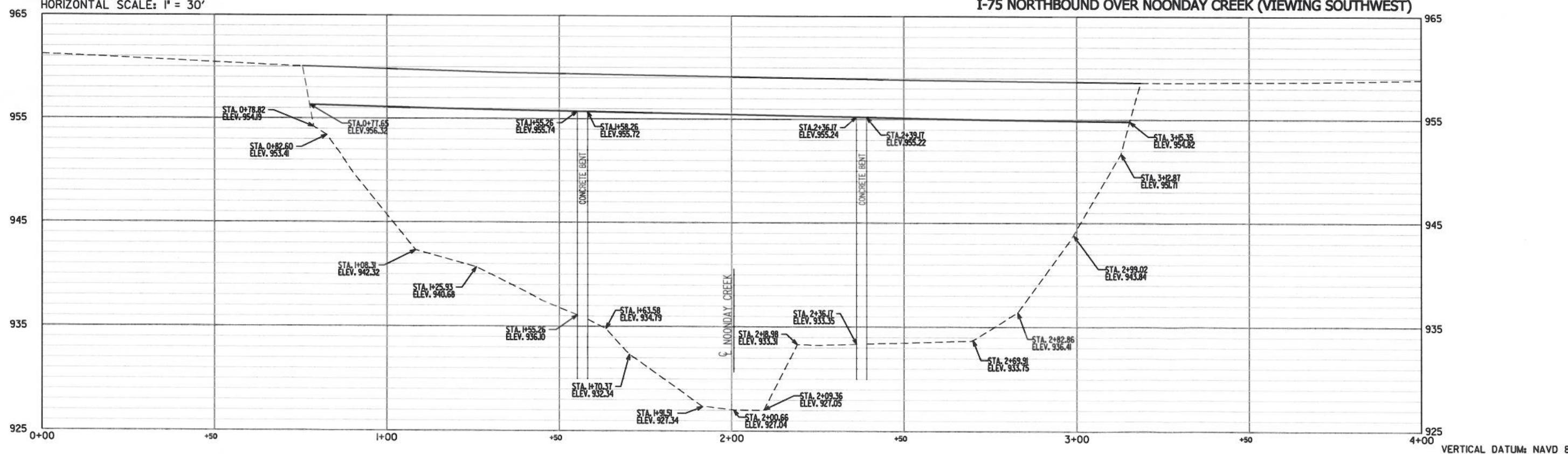
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REV A 12/18/08	UTILITY PLANS
REV B 02/23/09	PROJECT CSNHS-0008-00(256)
REV C 04/01/09	P. I. 0008256
	DRAWING NO. 24-0T





VERTICAL SCALE: 1" = 10'
HORIZONTAL SCALE: 1" = 30'

I-75 NORTHBOUND OVER NOONDAY CREEK (VIEWING SOUTHWEST)

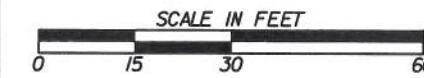


E: THIS PROFILE INDICATES ELEVATIONS ALONG THE CENTERLINE OF I-75 NORTHBOUND OVER NOONDAY CREEK.

P. I. NO. 0008256	LONG JOB NO 0165-0020
DRAWN BY VCH	DATE 8/18/2008
CHECKED BY JGL	SCALE 1° - 30'

LONG
ENGINEERING, INC.

1780 Corporate Drive
Suite 400
Norcross, Georgia 30093
Tel 770.931.8005
Fax 770.931.8555
www.longeng.com



REVISION DATES

**STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION**

BRIDGE CLEARANCE

**I-75 FROM CANTON ROAD
TO 2000' PAST WOODSTOCK ROAD**

**I-75(NB) OVER
NOONDAY CREEK**

CURVE BR21-I

PI 2+00.08

N 1,463,338.5876

2,173,864.0842

~ 4° 04' 37" (LT)

D 1° 01' 09"

R 5,621.55

L 400.00

T 200.08

0+00

1+00

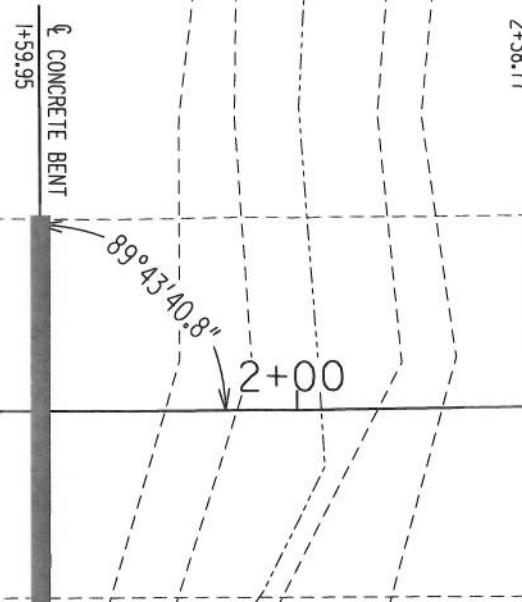
2+00

3+00

4+00

P.I. STA. 4+00
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E=2173790.5392

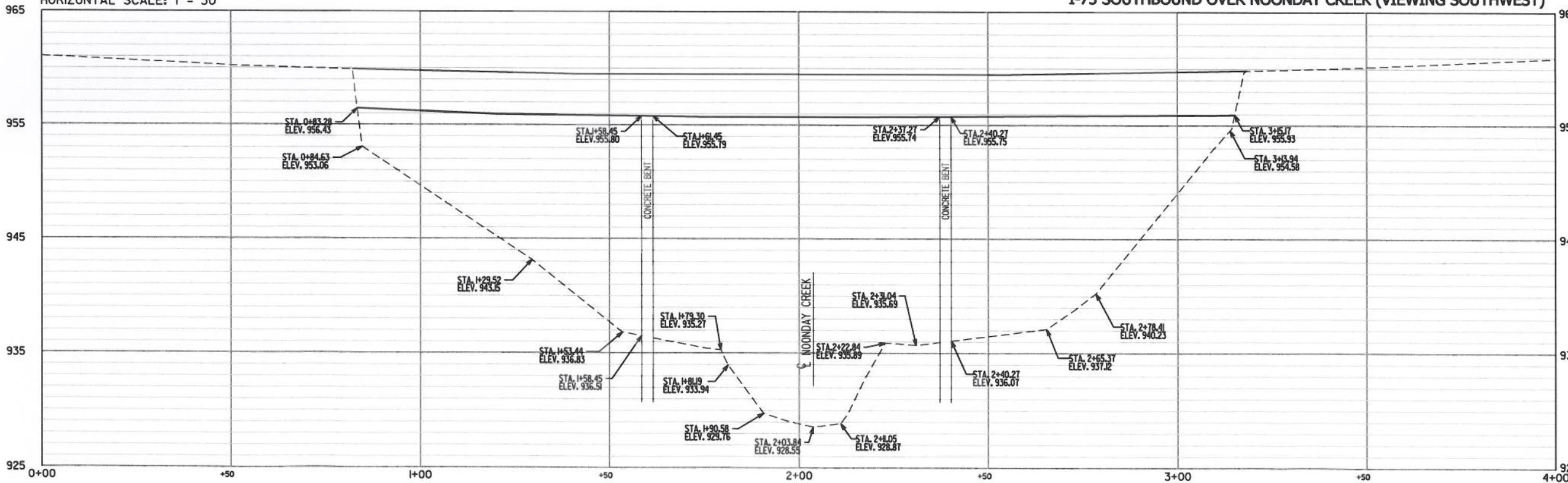
I-75 (SOUTHBOUND)



NAD 83 GA. WEST
GRID NORTH

VERTICAL SCALE: 1' = 10'
HORIZONTAL SCALE: 1' = 30'

I-75 SOUTHBOUND OVER NOONDAY CREEK (VIEWING SOUTHWEST)



965

955

945

935

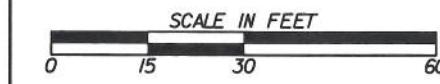
VERTICAL DATUM: NAVD 88

RE: THIS PROFILE INDICATES ELEVATIONS ALONG THE CENTERLINE OF I-75 SOUTHBOUND OVER NOONDAY CREEK.

P. I. NO.
0008256LONG JOB NO.
0165-0020DRAWN BY
VCHDATE
8/18/2008CHECKED BY
JGLSCALE
1' - 30'

LONG
ENGINEERING, INC.

1780 Corporate Drive
Suite 400
Norcross, Georgia 30093
Tel 770.931.8005
Fax 770.931.8555
www.longeng.com



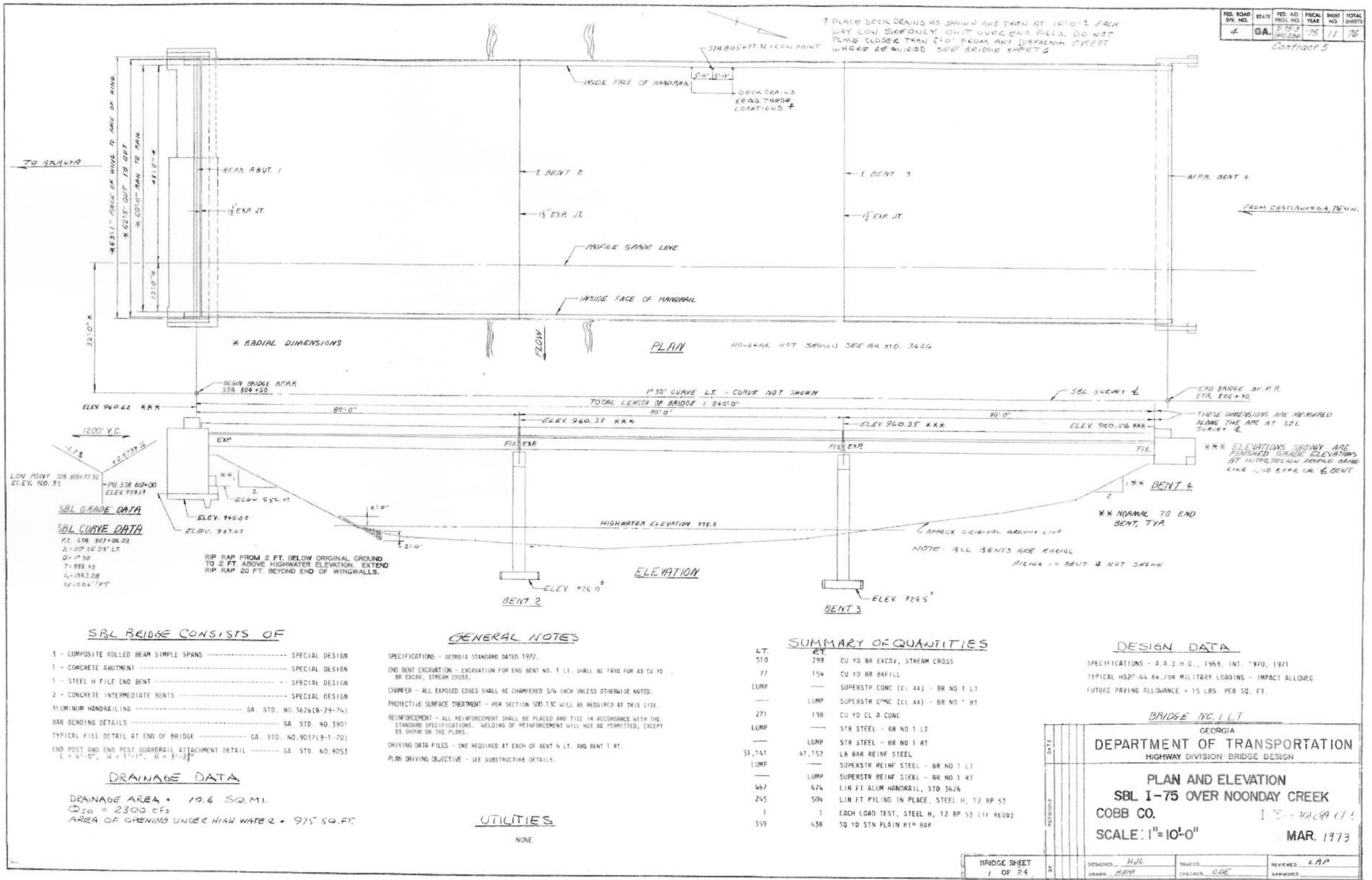
REVISION DATES

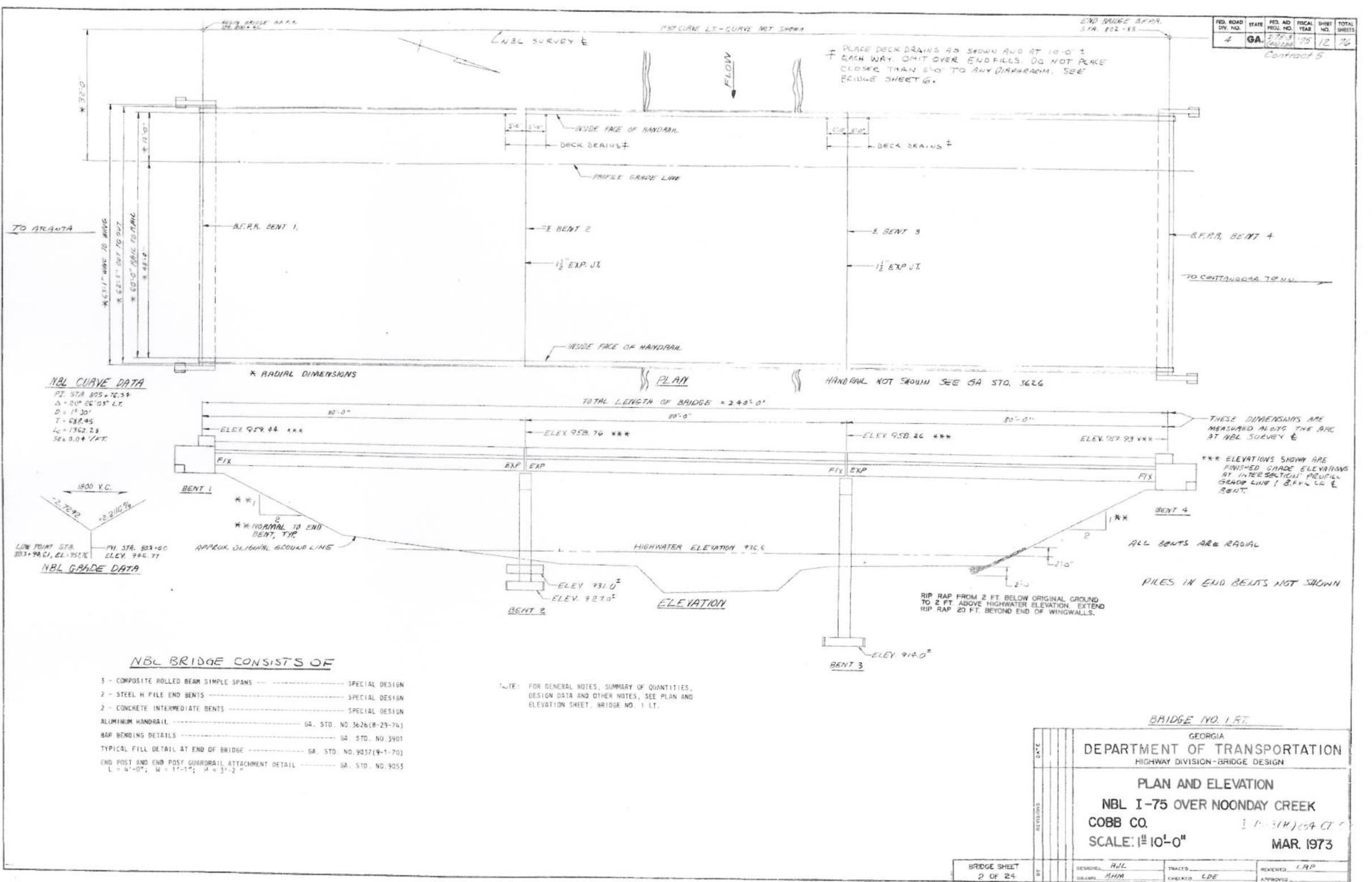
STATE OF GEORGIA
DEPARTMENT OF TRANSPORTATION

BRIDGE CLEARANCE

I-75 FROM CANTON ROAD
TO 2000' PAST WOODSTOCK ROAD
I-75(SB) OVER
NOONDAY CREEK

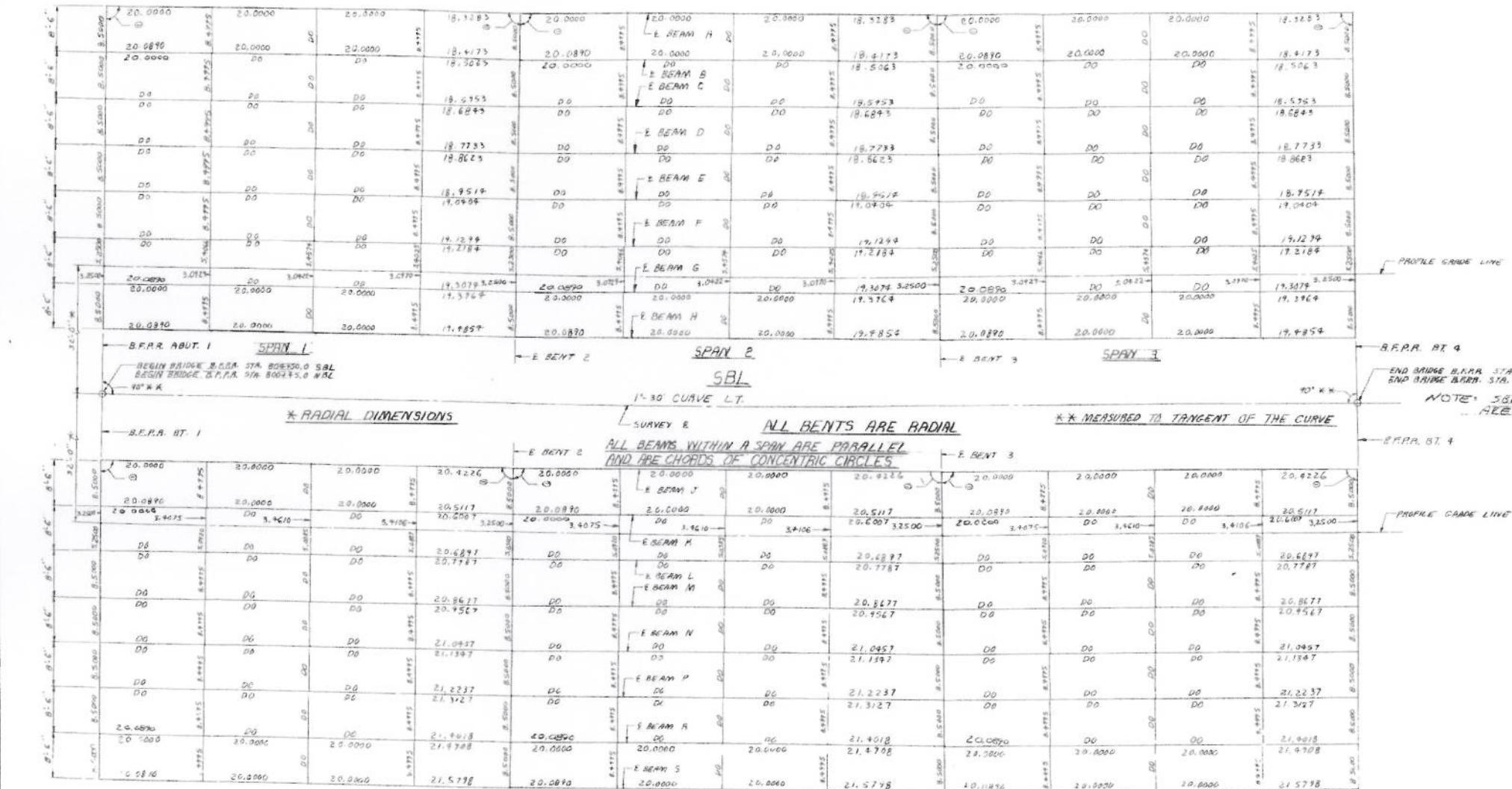
DRAWING NO.
21





PROJ. ROAD DIV. NO.	STATE	PROJ. AID NO.	FISCAL YEAR	SPANN. NO.	TOTAL SHEETS
4	GA	I-75-3 Project	'75	13	76

Contract 5

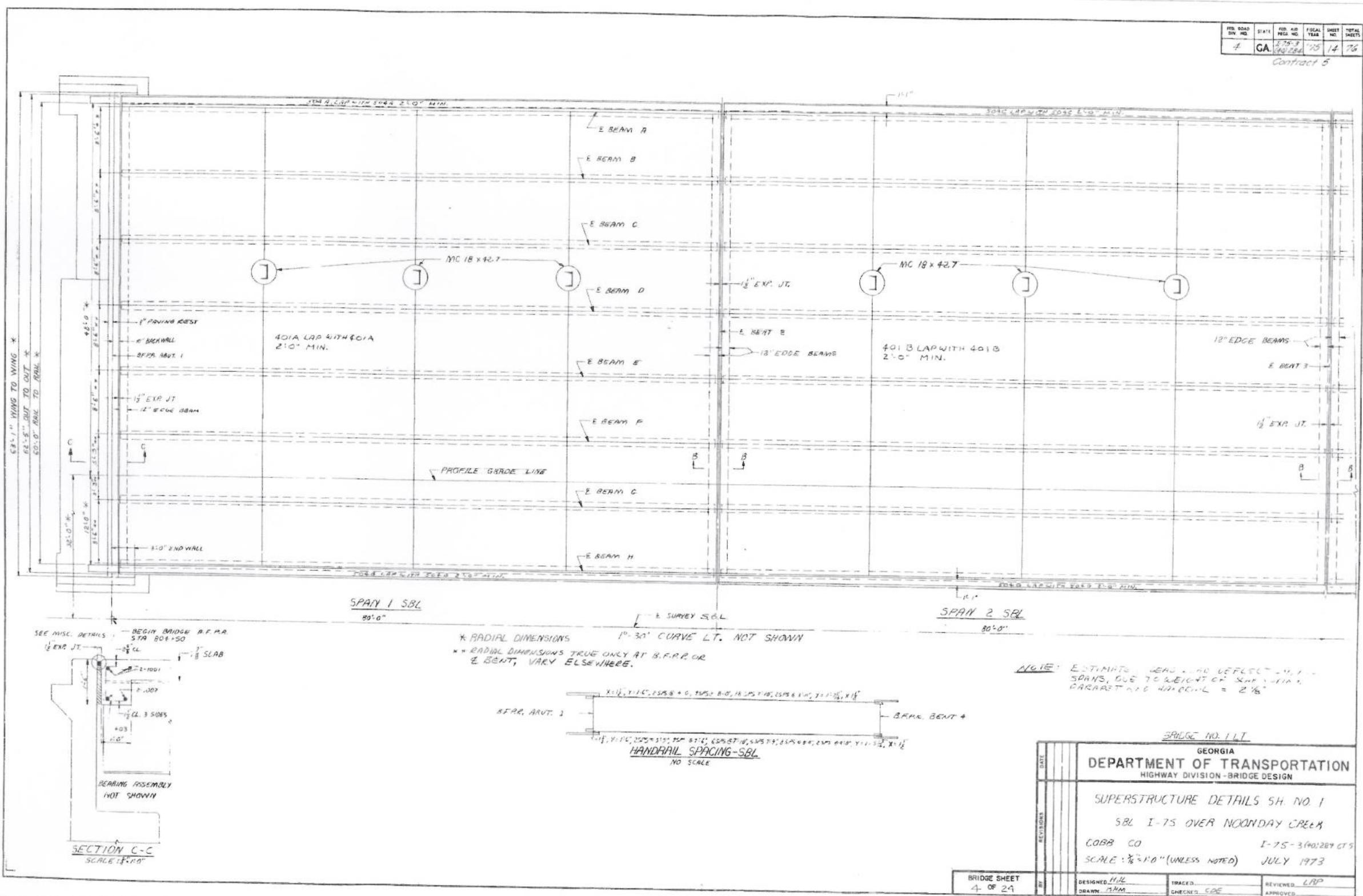


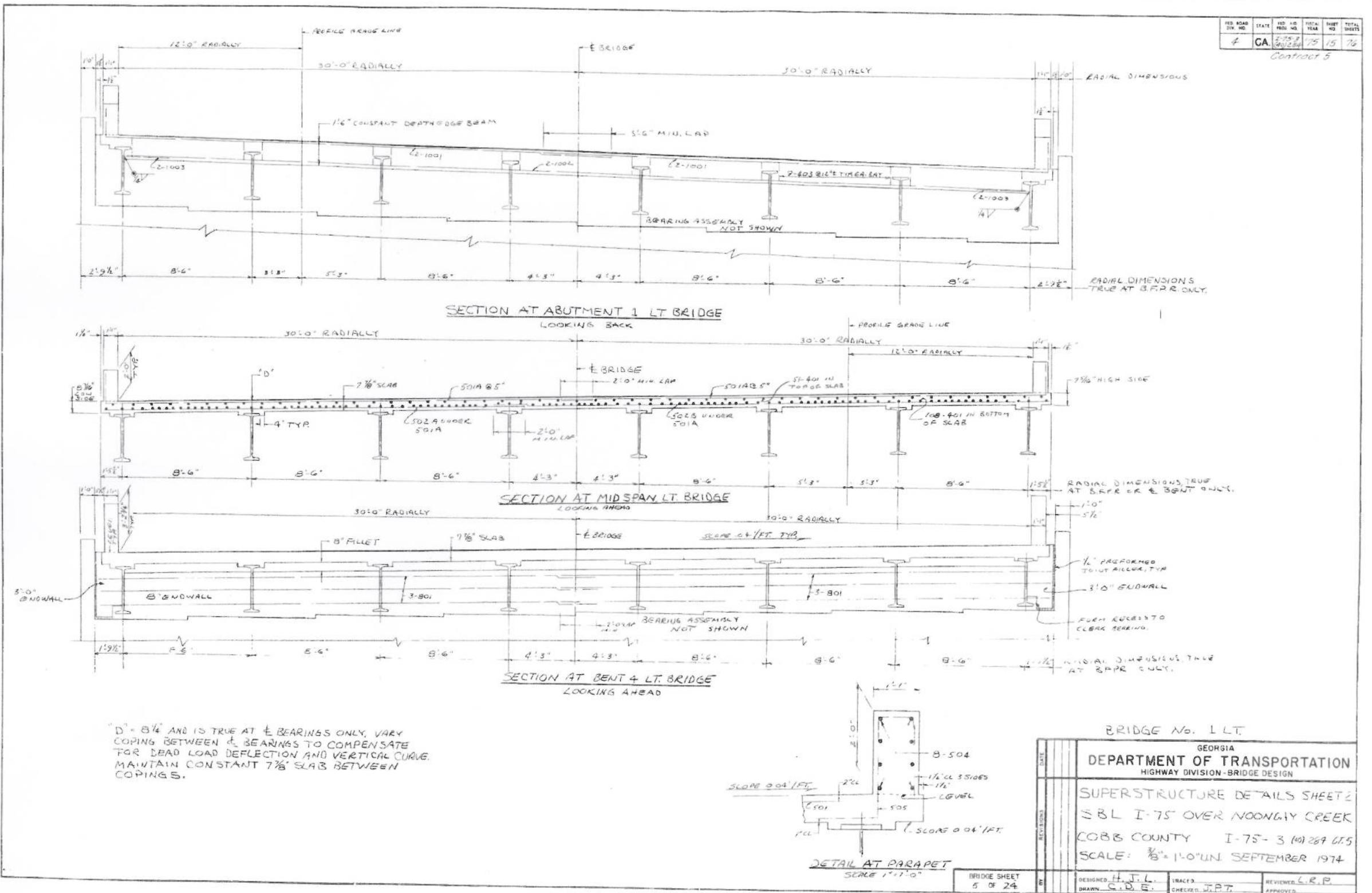
BRIDGE NO. 1 LT & RT	
GEORGIA	
DEPARTMENT OF TRANSPORTATION	
HIGHWAY DIVISION - BRIDGE DESIGN	
DATE	
REVISION	
BEAM CHORD LAYOUT	
I-75 OVER NOONDAY CREEK	
COBB CO.	
I-75-3 (90) 284 CT. 5	
SCALE: 1'=10' 0"	
AUG. 1974	
BRIDGE SHEET	
3 OF 24	
DESIGNED: J.L. DRAWN: H.H.A.	TRACED: CHECKED: J.P.T.
REVIEWED: L.A.P.	APPROVED:

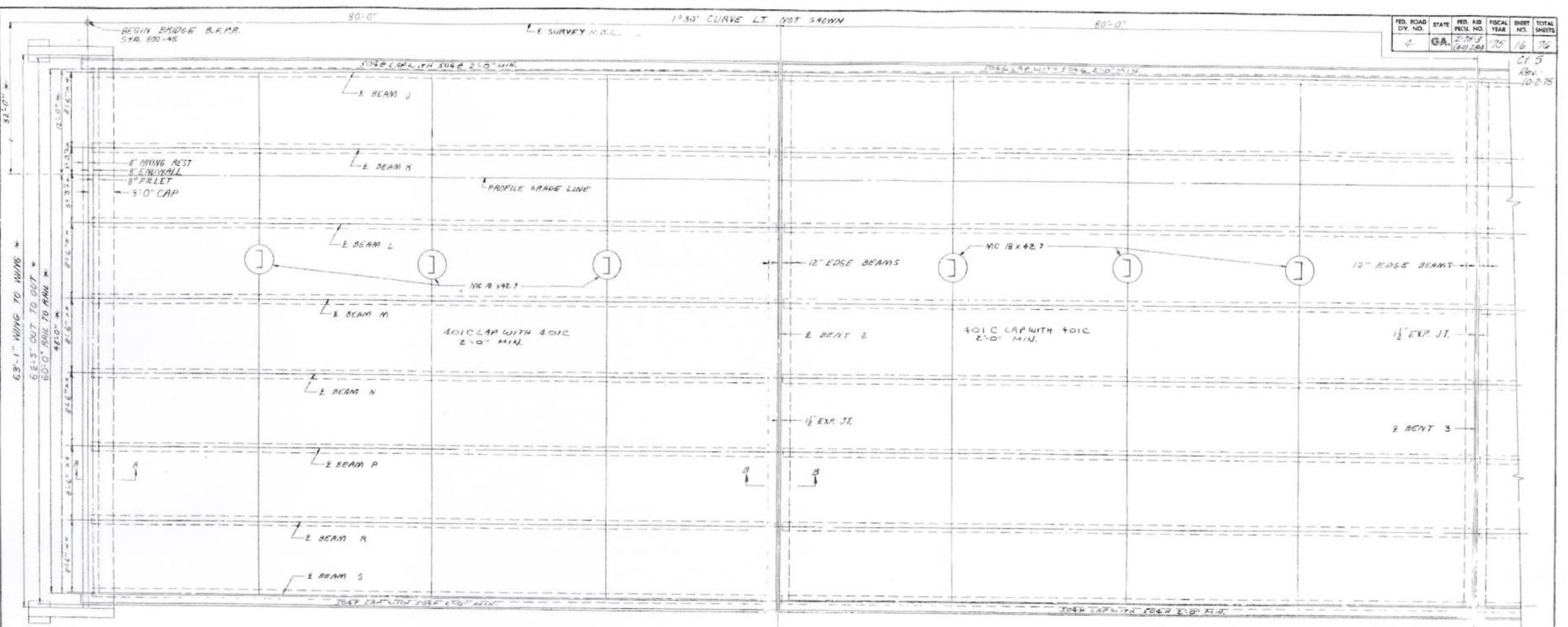
22

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	GA.	175-3 40284	'75	14	76

Contract 5

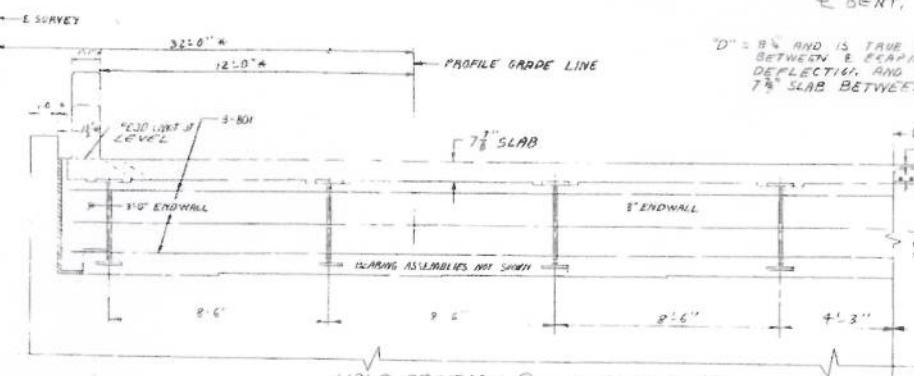






SPAN I NBI

* RADIAL DIMENSIONS
** RADIAL DIMENSIONS, TRUE ONLY AT BEND; R C
E BENT, VARY ELSEWHERE.

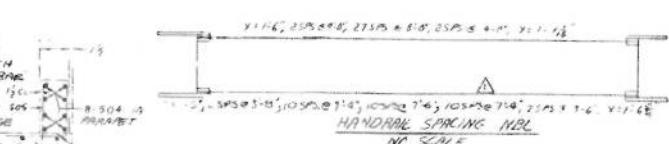


HALF SECTION @ END BEAM 4

LOOKING AHEAD
SCALE: 1/8 in.

NOTE: 501 & 502 BARS ARE PLACED RADIAL.
SPACING SHOWN IS MEASURED ALONG
RIGHT GUTTER LINE.

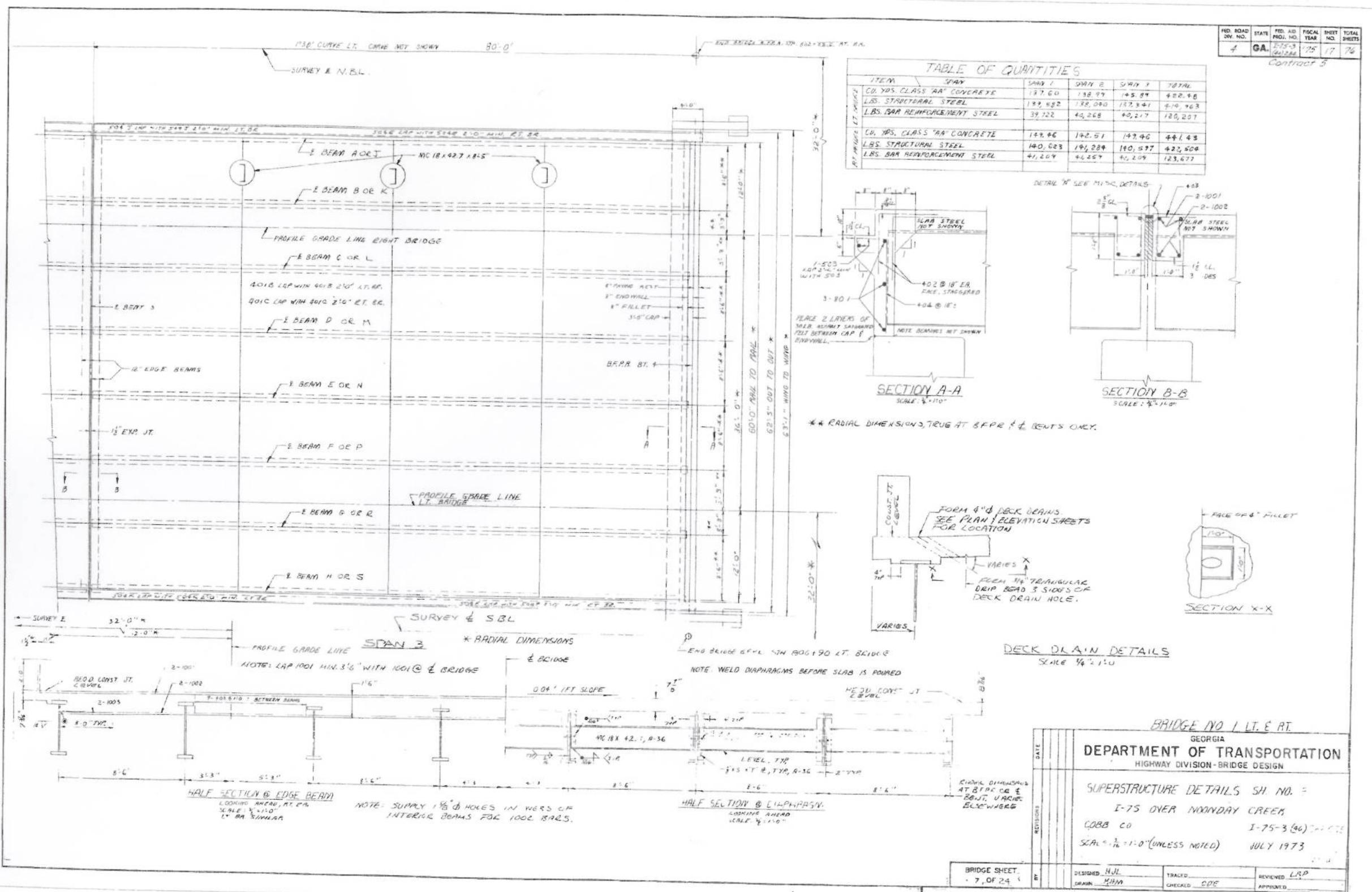
NOTE: ESTIMATED DEAD LOAD DEFLECTION OVER
TO WEIGHT OF SLABS, COPING, PARAPET
AND HAND RAIL = 2 1/2" ALL SPANS
SPAN 2 NBL



GEORGIA
DEPARTMENT OF TRANSPORTATION

SUPERSTRUCTURE DETAILS SH NO. 3
NBL I-75 OVER WINDOM CREEK
COSCO CO. I-75-3202854 SFS
SCALE: 1/8 = 10'-0" (FORRESS NOTED) JULY 1973

BRIDGE SHEET	DESIGNED <i>Roll</i>	TRACED <i>CDE</i>	REVIEWED <i>LRP</i>
6 OF 24	DRAWN <i>SMA</i>	CHECKED <i>CDE</i>	APPROVED



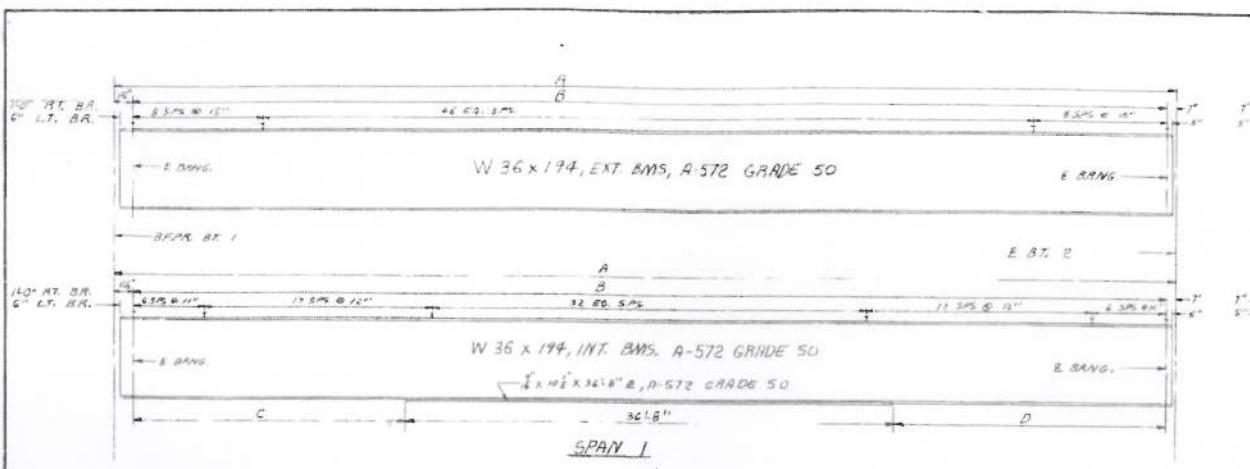


TABLE OF LETTERED DIM.																			
SPAN	DIM	BEAM	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	
1	A	78'-3 1/2"	78'-6 1/2"	78'-9 1/2"	78'-12 1/2"	78'-15 1/2"	78'-18 1/2"	78'-21 1/2"	78'-24 1/2"	78'-27 1/2"	78'-30 1/2"	78'-33 1/2"	78'-36 1/2"	78'-39 1/2"	78'-42 1/2"	78'-45 1/2"	81'-5 1/2"	81'-8"	
	B	76'-2 1/2"	76'-5 1/2"	76'-7 1/2"	76'-10 1/2"	76'-13 1/2"	76'-16 1/2"	76'-19 1/2"	76'-22 1/2"	76'-25 1/2"	76'-28 1/2"	76'-31 1/2"	76'-34 1/2"	76'-37 1/2"	76'-40 1/2"	76'-43 1/2"	78'-7 1/2"	78'-10"	
	C	19'-7 1/2"	19'-10 1/2"	19'-11 1/2"	20'-0 1/2"	20'-1 1/2"	20'-2 1/2"	20'-3 1/2"	20'-4 1/2"	20'-5 1/2"	20'-6 1/2"	20'-7 1/2"	20'-8 1/2"	20'-9 1/2"	20'-10 1/2"	20'-11 1/2"	21'-0 1/2"	21'-1 1/2"	21'-2 1/2"
	D	18'-9 1/2"	18'-11 1/2"	18'-12 1/2"	20'-0 1/2"	20'-1 1/2"	20'-2 1/2"	20'-3 1/2"	20'-4 1/2"	20'-5 1/2"	20'-6 1/2"	20'-7 1/2"	20'-8 1/2"	20'-9 1/2"	20'-10 1/2"	20'-11 1/2"	21'-0 1/2"	21'-1 1/2"	21'-2 1/2"
2	A	78'-3 1/2"	78'-6 1/2"	78'-9 1/2"	78'-12 1/2"	78'-15 1/2"	78'-18 1/2"	78'-21 1/2"	78'-24 1/2"	78'-27 1/2"	78'-30 1/2"	78'-33 1/2"	78'-36 1/2"	78'-39 1/2"	78'-42 1/2"	78'-45 1/2"	81'-5 1/2"	81'-8"	
	B	77'-1 1/2"	77'-4 1/2"	77'-6 1/2"	77'-9 1/2"	77'-12 1/2"	77'-15 1/2"	77'-18 1/2"	77'-21 1/2"	77'-24 1/2"	77'-27 1/2"	77'-30 1/2"	77'-33 1/2"	77'-36 1/2"	77'-39 1/2"	77'-42 1/2"	78'-1 1/2"	78'-4 1/2"	
	C	20'-3"	20'-4 1/2"	20'-5 1/2"	20'-6 1/2"	20'-7 1/2"	20'-8 1/2"	20'-9 1/2"	20'-10 1/2"	20'-11 1/2"	20'-12 1/2"	20'-13 1/2"	20'-14 1/2"	20'-15 1/2"	20'-16 1/2"	20'-17 1/2"	21'-0 1/2"	21'-1 1/2"	21'-2 1/2"
	D	20'-0 1/2"	20'-1 1/2"	20'-2 1/2"	20'-3 1/2"	20'-4 1/2"	20'-5 1/2"	20'-6 1/2"	20'-7 1/2"	20'-8 1/2"	20'-9 1/2"	20'-10 1/2"	20'-11 1/2"	20'-12 1/2"	20'-13 1/2"	20'-14 1/2"	20'-15 1/2"	20'-16 1/2"	21'-0 1/2"
3	A	78'-3 1/2"	78'-6 1/2"	78'-9 1/2"	78'-12 1/2"	78'-15 1/2"	78'-18 1/2"	78'-21 1/2"	78'-24 1/2"	78'-27 1/2"	78'-30 1/2"	78'-33 1/2"	78'-36 1/2"	78'-39 1/2"	78'-42 1/2"	78'-45 1/2"	81'-5 1/2"	81'-8"	
	B	76'-2 1/2"	76'-5 1/2"	76'-7 1/2"	76'-10 1/2"	76'-13 1/2"	76'-16 1/2"	76'-19 1/2"	76'-22 1/2"	76'-25 1/2"	76'-28 1/2"	76'-31 1/2"	76'-34 1/2"	76'-37 1/2"	76'-40 1/2"	76'-43 1/2"	78'-7 1/2"	78'-10"	
	C	19'-7 1/2"	19'-10 1/2"	19'-11 1/2"	20'-0 1/2"	20'-1 1/2"	20'-2 1/2"	20'-3 1/2"	20'-4 1/2"	20'-5 1/2"	20'-6 1/2"	20'-7 1/2"	20'-8 1/2"	20'-9 1/2"	20'-10 1/2"	20'-11 1/2"	21'-0 1/2"	21'-1 1/2"	21'-2 1/2"
	D	18'-8 1/2"	18'-10 1/2"	18'-11 1/2"	20'-0 1/2"	20'-1 1/2"	20'-2 1/2"	20'-3 1/2"	20'-4 1/2"	20'-5 1/2"	20'-6 1/2"	20'-7 1/2"	20'-8 1/2"	20'-9 1/2"	20'-10 1/2"	20'-11 1/2"	21'-0 1/2"	21'-1 1/2"	21'-2 1/2"

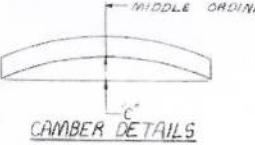
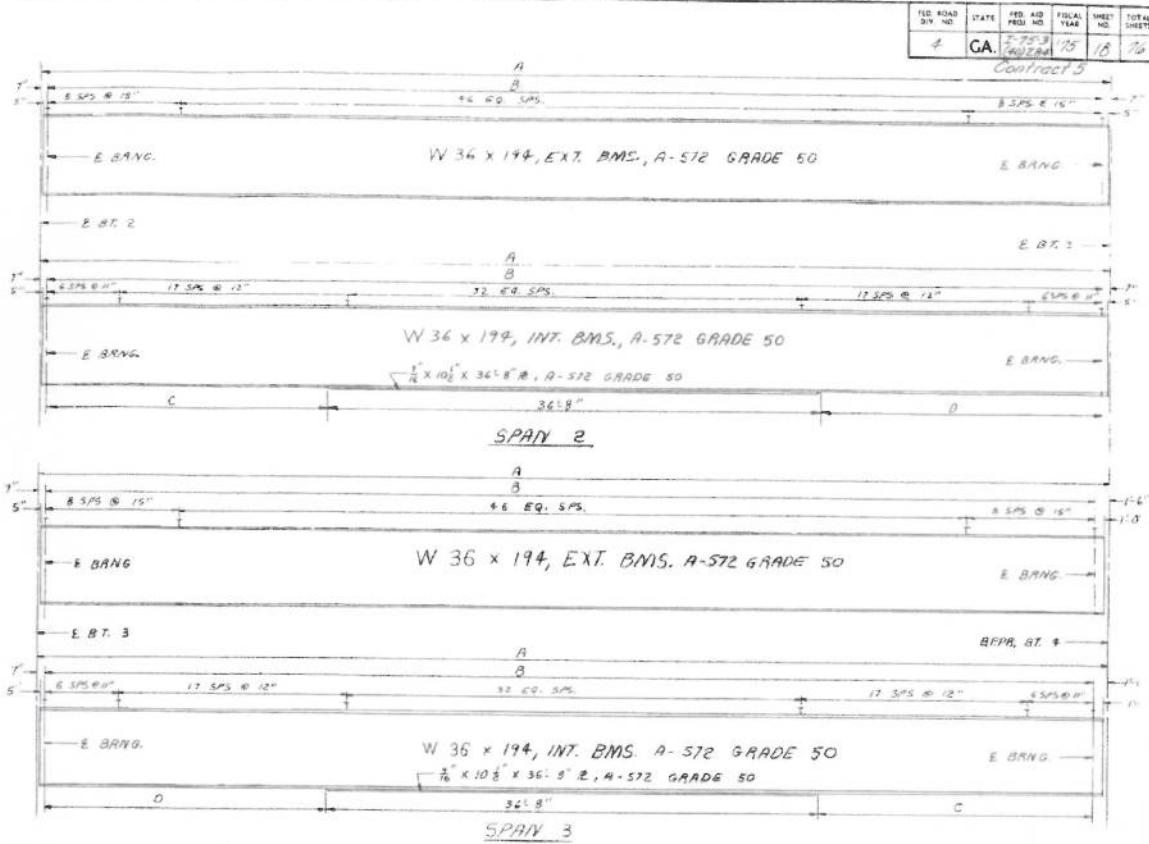


TABLE OF C"	
LT. BR	INT. 1 1/2"
	EXT. 1 1/2"
BT. BR	INT. 2 1/2"
	EXT. 1 1/2"



NOTE: CAMBER INCLUDES WEIGHT OF BEAM, SLAB, COPING, PARAPET & HANDRAIL

NOTE: FOR FURTHER DETAILS OF COVER PLATES AND SHEAR CONNECTORS SEE MISC. DETAILS.
COVER & WELD = $\frac{1}{8}$; TERMINAL WELD = $\frac{3}{8}$; N = 3

STEEL NOTE

ALL ROLLED BEAMS AND COVER PLATES ARE MAIN LOAD CARRYING MEMBER COMPONENTS SUBJECT TO TENSILE STRESS AND SHALL MEET THE CHARPY V-NOTCH TEST REQUIREMENTS AS SPECIFIED BY SPECIAL PROVISION MODIFYING SECTION R51 OF THE STANDARD SPECIFICATIONS. ALL ROLLED BEAMS AND COVER PLATES SHALL BE ASTM DESIGNATION A-572, GRADE 50.

ALL DIAPHARAFMS AND DIAPHRAGM CONNECTOR PLATES SHALL BE ASTM DESIGNATION A-36.

BRIDGE NO. I.LT. & R.T.

GEORGIA
DEPARTMENT OF TRANSPORTATION
HIGHWAY DIVISION-BRIDGE DESIGN

STRUCTURAL STEEL DETAILS

I-75 OVER NOONDAY CREEK

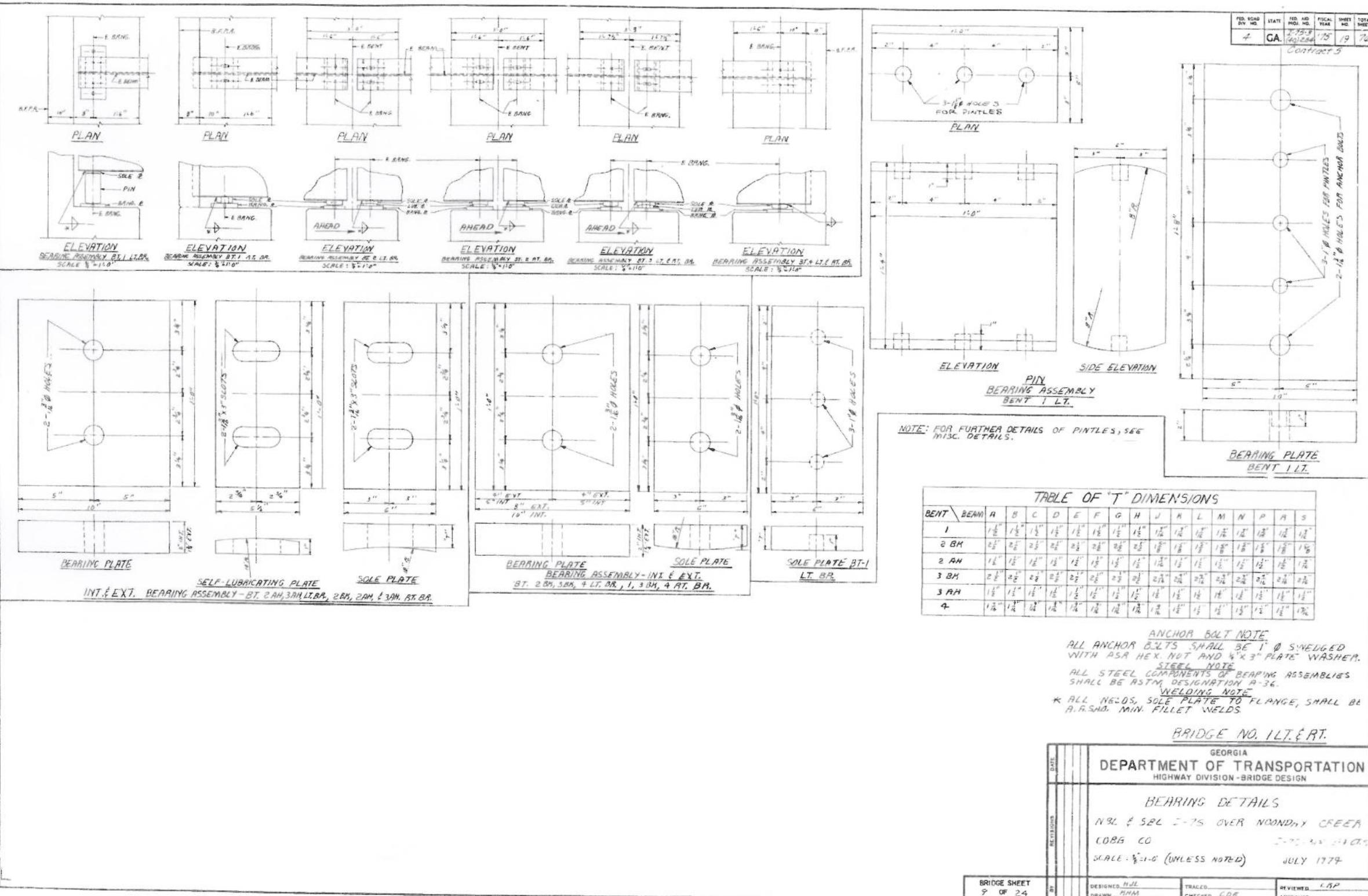
COBB CO. 1-75 - 1-17x CT.S

NO SCALE JULY 1974

BRIDGE SHEET	DATE	DESIGNED BY	TRACED BY	REVIEWED BY
B OF 24	8/	DRAWN BY JHM	CHECKED BY JPT	APPROVED BY LAP

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	GA.	175-3 401204	'75	19	76

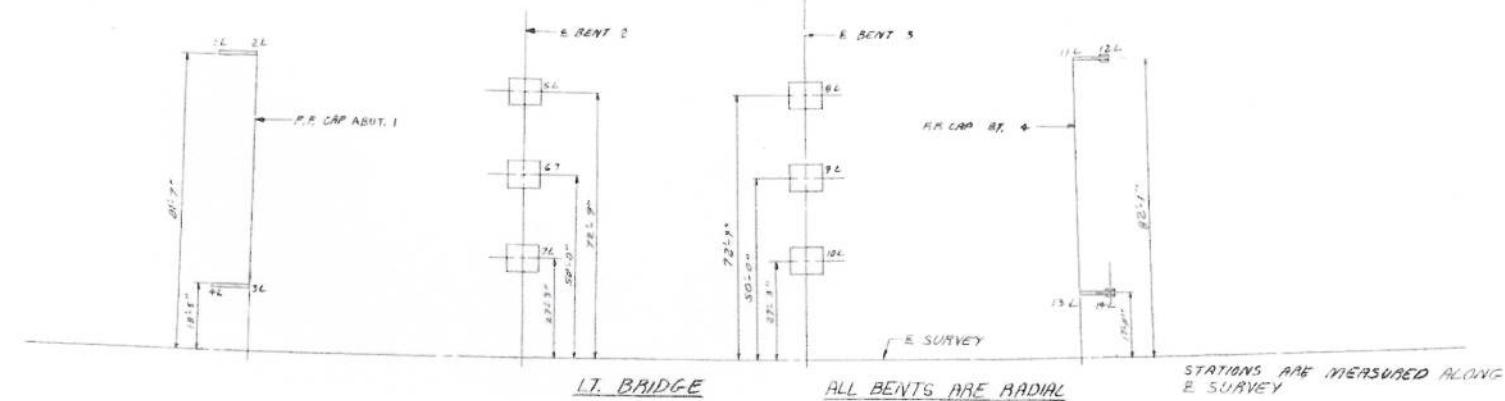
Contract 5



FED. ROAD DIV. NO.	STATE	FED. AID REQ'D.	FISCAL YEAR	SHET NO.	TOTAL SHEETS
4	GA.	175-3 175-2	'75	20	76

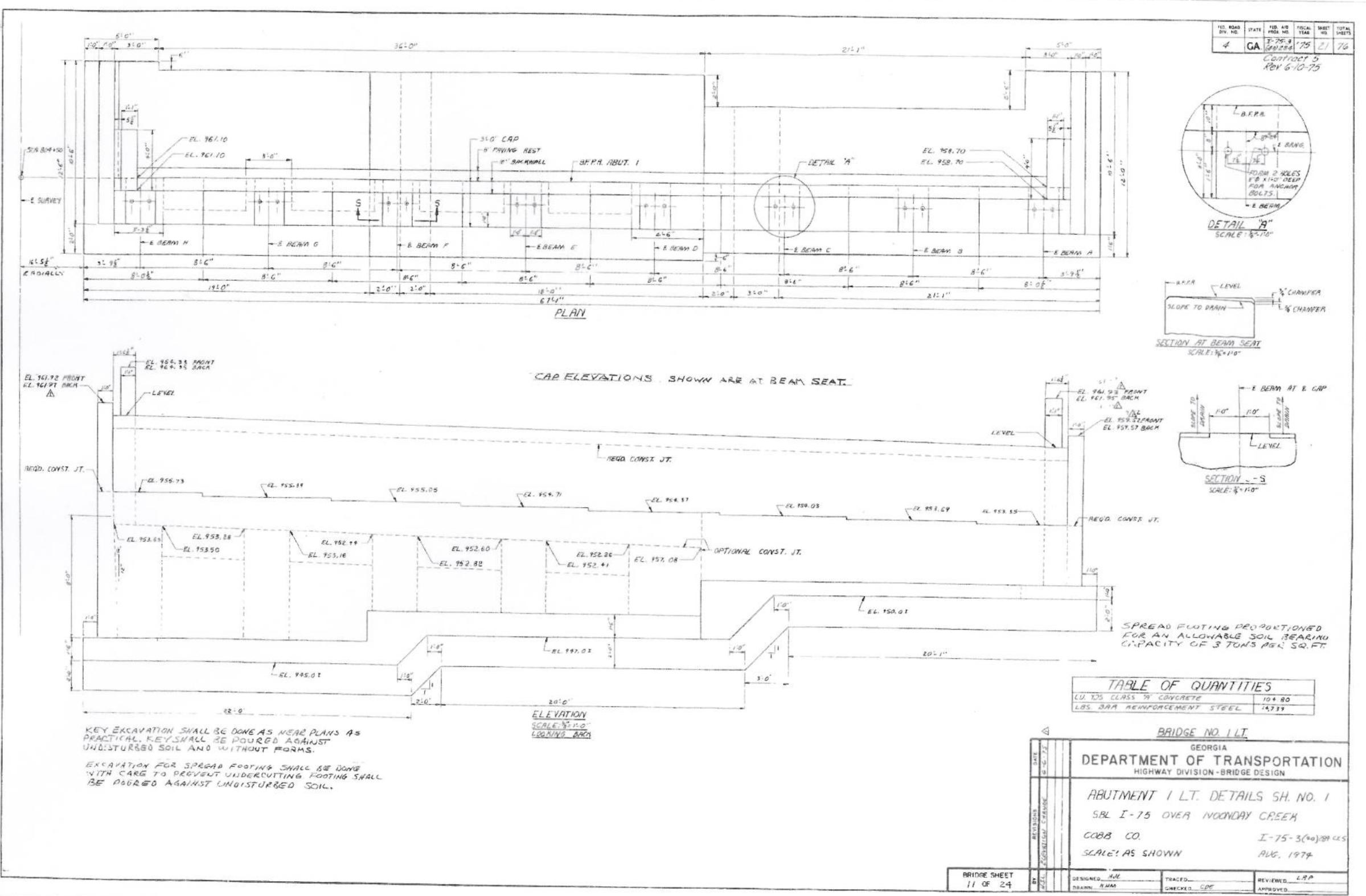
Contract 5

POINT	S.T.P.
1L	804 + 42, 49
2L	804 + 55, 07
3L	804 + 53, 01
4L	804 + 42, 46
5L	805 + 36, 5
6L	805 + 30, 0
7L	805 + 30, 0
8L	805 + 10, 0
9L	806 + 10, 0
10L	806 + 10, 0
11L	806 + 36, 93
12L	806 + 35, 88
13L	806 + 36, 99
14L	806 + 35, 78



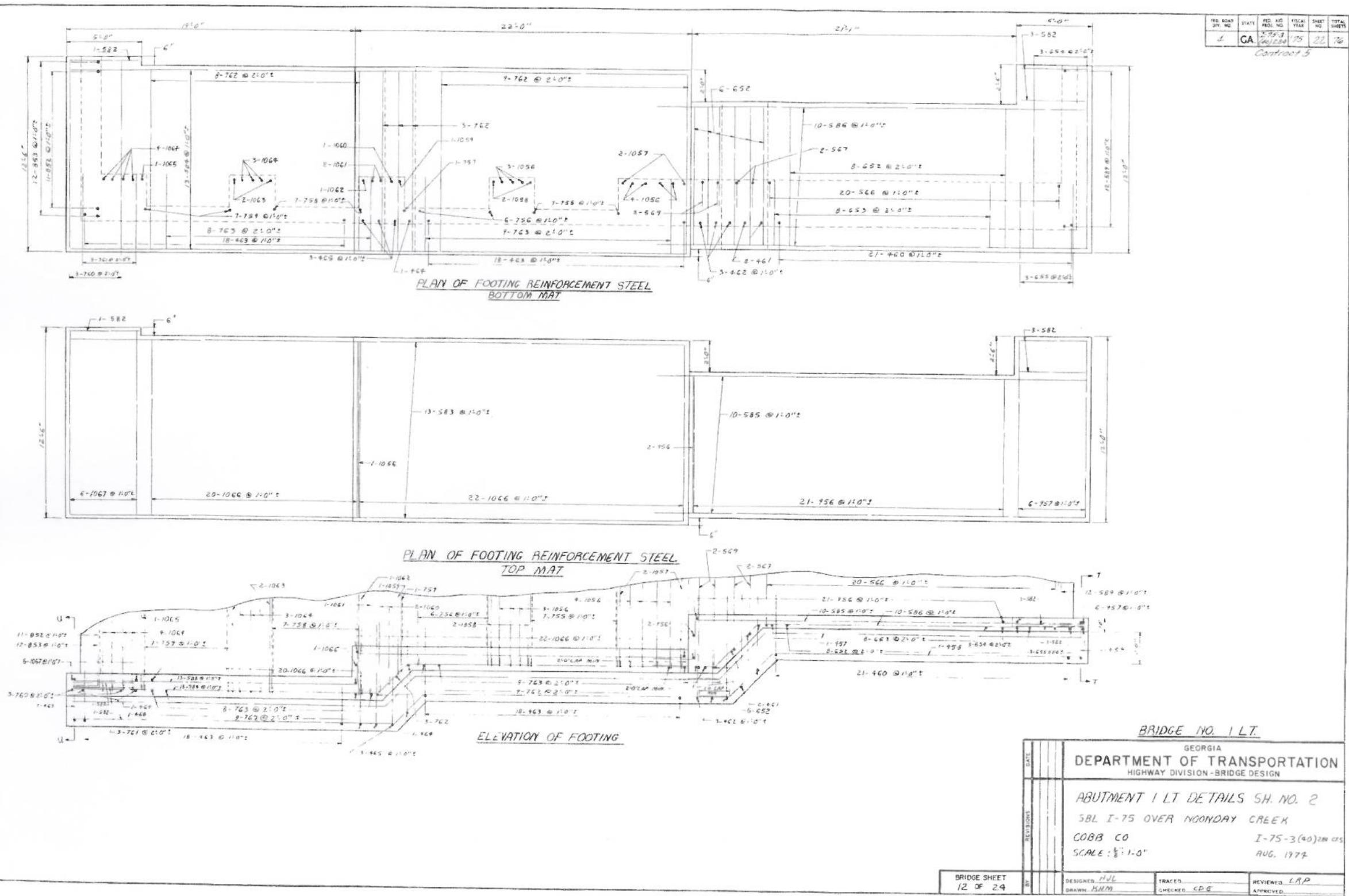
NOTE: STATIONS AT INTERMEDIATE BENTS ARE GIVEN AT
EACH COLUMN AT E GENT. STATIONS AT BENTWYTHAT
ARE GIVEN AT INSIDE FACE OF WING AT FF CEA
AND AT END OF WING. STATIONS AT BENT + ARE
GIVEN AT INTERSECTION OF FF CAP AND INSIDE FACE
OF WING AND AT E WING PLE.

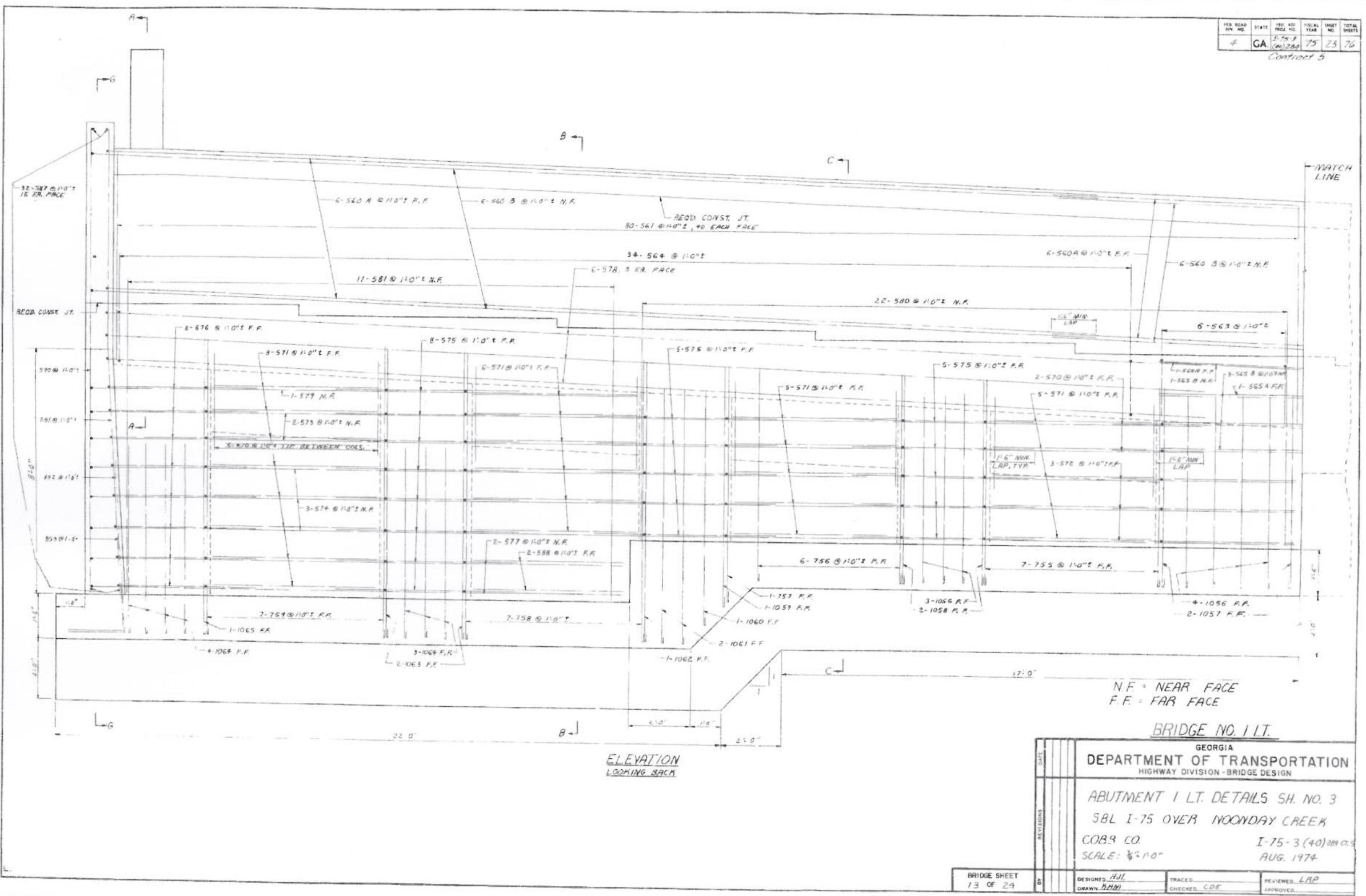
		BRIDGE NO. 1, L.	
DATE	GEORGIA		
	DEPARTMENT OF TRANSPORTATION		
HIGHWAY DIVISION - BRIDGE DESIGN			
REVISIONS	SUBSTITUTE BY-LIN. T SHEET 1		
	SBC I-75 OVER NOONDAY CREEK		
SCALE:	COBB CO.		I-75-3(G)1264 CPS
	1"=20'-0"		FEB. 1975
BY	DESIGNED: HUL	TRACED: SPT	REVIEWED: LAP
	DRAWN: RAN	CHEKED: SPT	APPROVED:



FED. ROAD
STY. NO.
STATE
FED. AID
FED. NO.
FISCAL
YEAR
SHEET
NO.
TOTAL
SHEETS

Contract 5



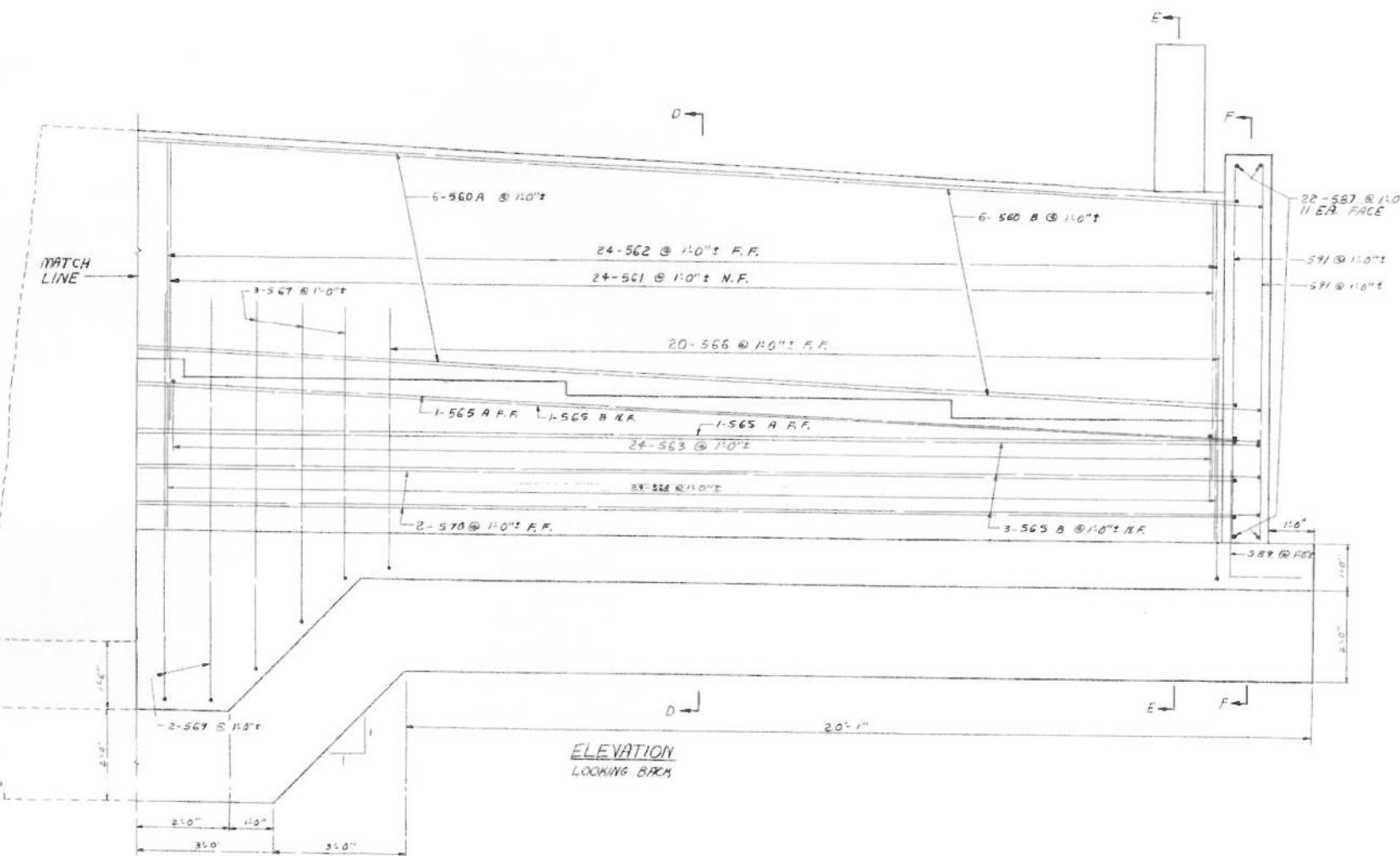


THIS DRAWING IS THE PROPERTY OF THE STATE OF GEORGIA DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION - BRIDGE DESIGN

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
4	GA.	1753 300284	75	24	76

Contract 5

Contract 5

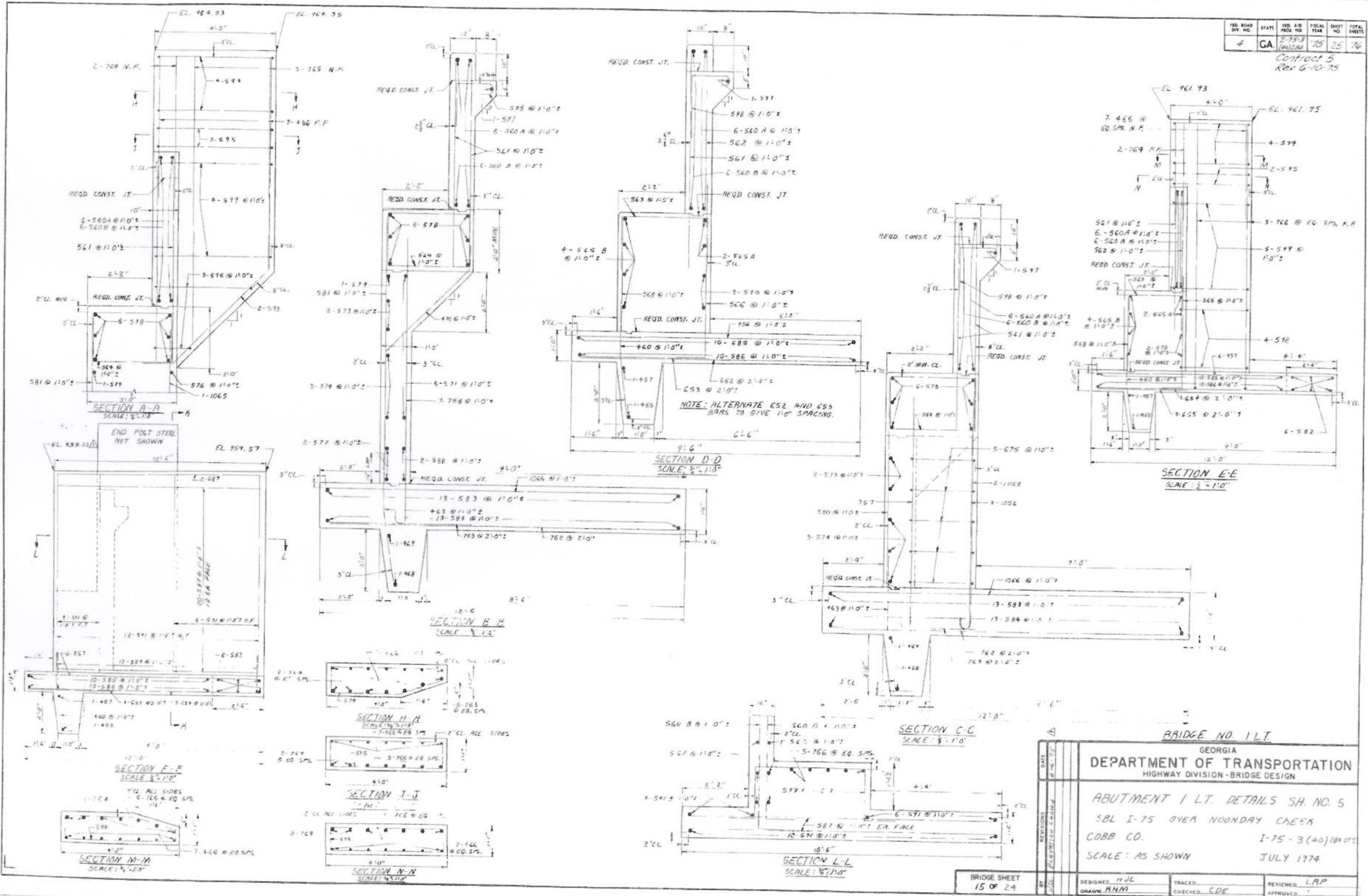


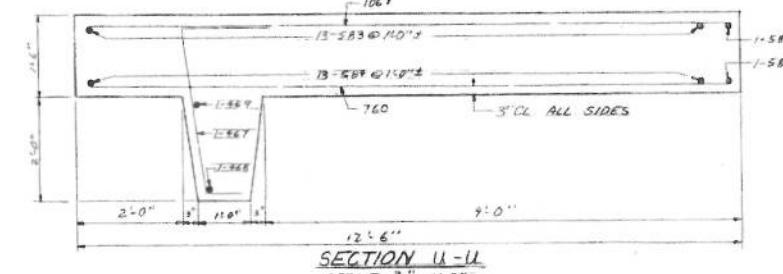
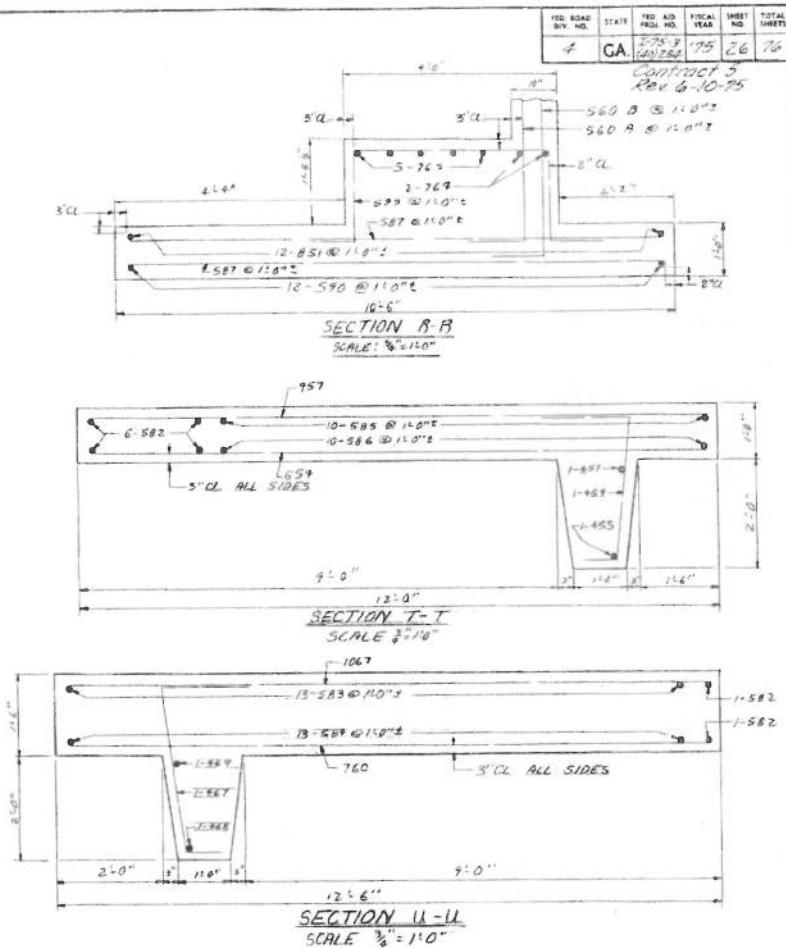
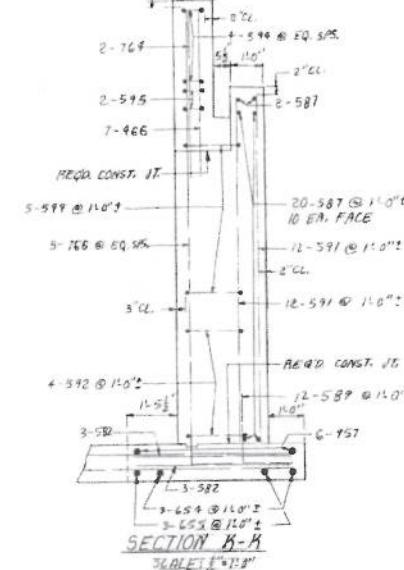
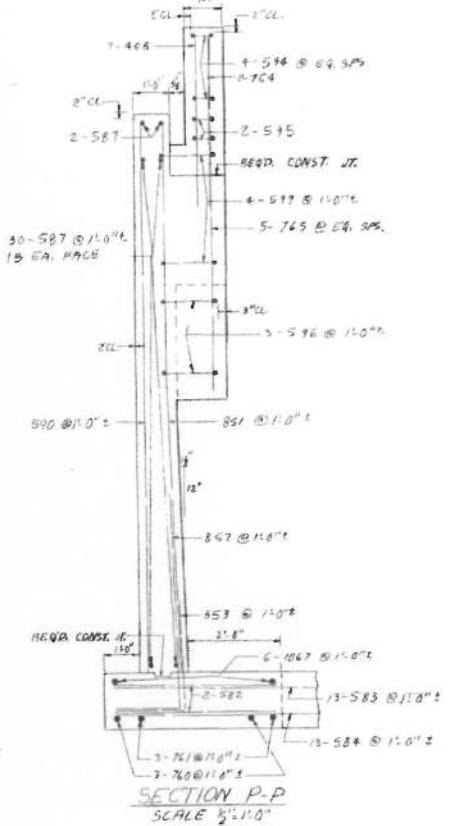
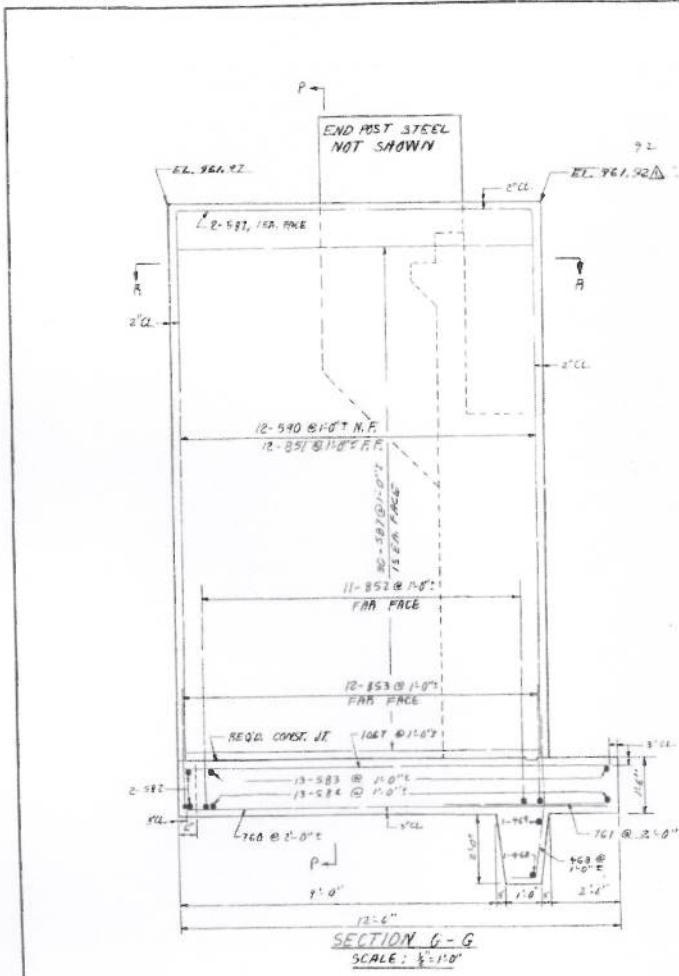
N.F. = NEAR FACE
F.F. = FAR FACE

BRIDGE NO. 1 LT.

GEORGIA

		BRIDGE NO. I LT.		
DATE		GEORGIA		
		DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION - BRIDGE DESIGN		
REVISION		ABUTMENT I LT. DETAILS SH. NO. 4		
		SBL I-75 OVER NOONDAY CREEK COBB CO. I-75-3(4) 284 CR. S		
	SCALE: $\frac{1}{6}$ = 1:0 AUG. 1974			
BRIDGE SHEET 14 OF 24		DESIGNED H.W. DRAWN B.H.M.	TRACED CHECKED C.D.E.	REVIEWED L.R.P. APPROVED





BRIDGE NO. 1 LT.	
GEORGIA DEPARTMENT OF TRANSPORTATION HIGHWAY DIVISION - BRIDGE DESIGN	
DATE 6-16-74	REVISIONS 1
DESIGNER HJC	TRACED CDE
DRAWN MM	CHECKED CDE
REVIEWED LAP	APPROVED

ABUTMENT 1 LT. DETAILS SH. NO. 6
SBL I-75 OVER NOONDAY CREEK
COBB CO. I-75-3(40)287 CR.S
SCALE: AS SHOWN AUG. 1974

BRIDGE SHEET
16 OF 24

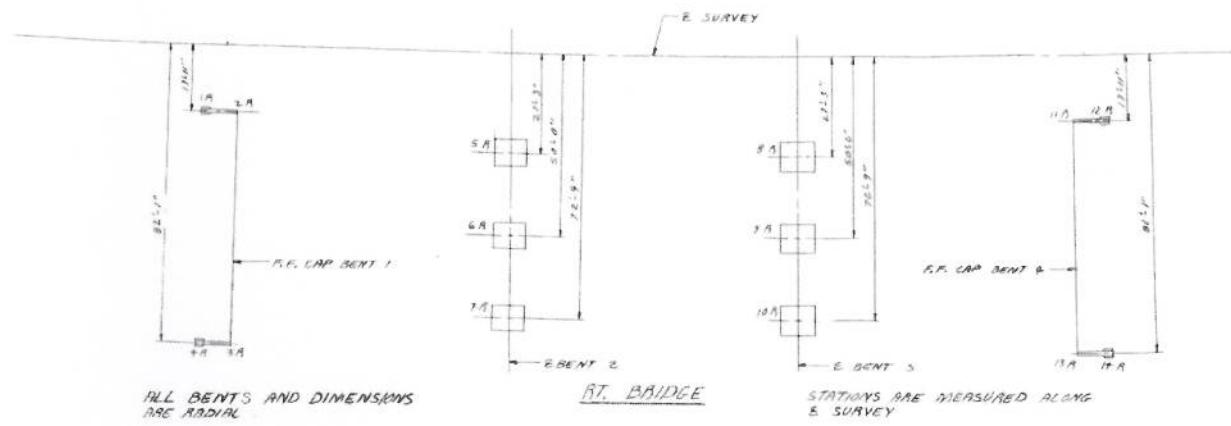
FEED ROAD DIV. NO.	STATE	FEED. AID. NO.	FISCAL YEAR	SHRIFT NO.	TOTAL SHEETS
4 GA.	I-75-B 201284	75	27	76	

Contract 5

TABLE OF STATIONS

POINT	STATION
1A	800+36.28
2A	800+46.99
3A	800+47.78
4A	800+48.87
5A	801+25.00
6A	801+25.00
7A	801+65.00
8A	802+05.00
9A	802+05.00
10A	802+05.00
11A	802+82.01
12A	802+82.76
13A	802+82.06
14A	802+98.63

NOTE: STATIONS FOR INTERMEDIATE BENTS ARE GIVEN AT THE INTERSECTION OF E COL AND E BENT.
STATIONS AT END BENTS ARE AT FRONT FACE OF CAP @ INSIDE FACE OF WING AND AT E WING PILE.



BRIDGE NO. 1A1	
GEORGIA	
DEPARTMENT OF TRANSPORTATION	
HIGHWAY DIVISION - BRIDGE DESIGN	
SUBSTRUCTURE LAYOUT SHEET 2	
NBL I-75 OVER NOONDAY CREEK	
COBB CO. I-75-3(40)284 CT. 5	
SCALE 1:1200 FEB. 1975	
DATE	
REVISIONS	
BY	
BRIDGE SHEET	17 OF 24
DESIGNED HJC DRAWN HJM	TRACED JPT
REVIEWED LAR	APPROVED

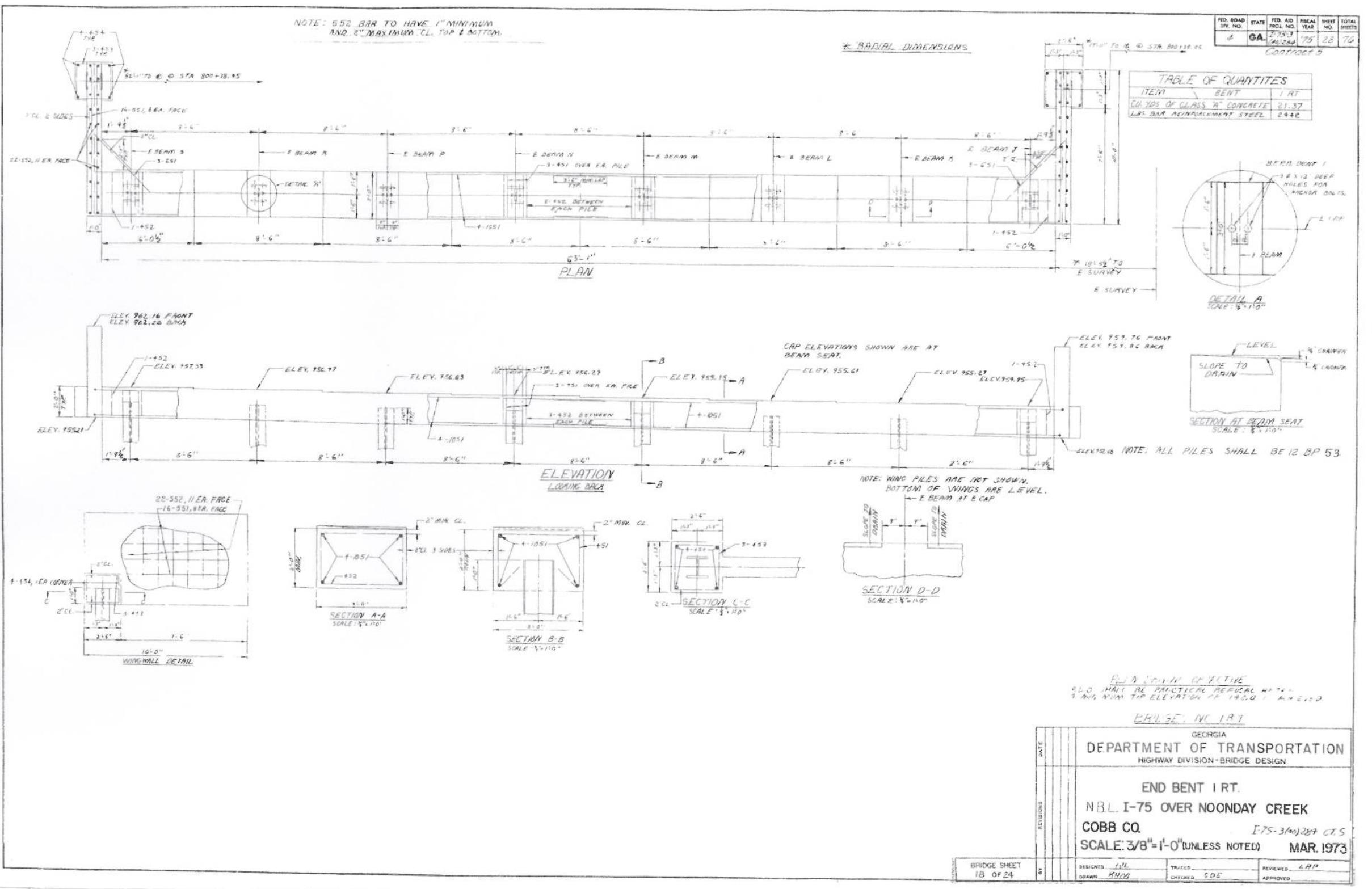
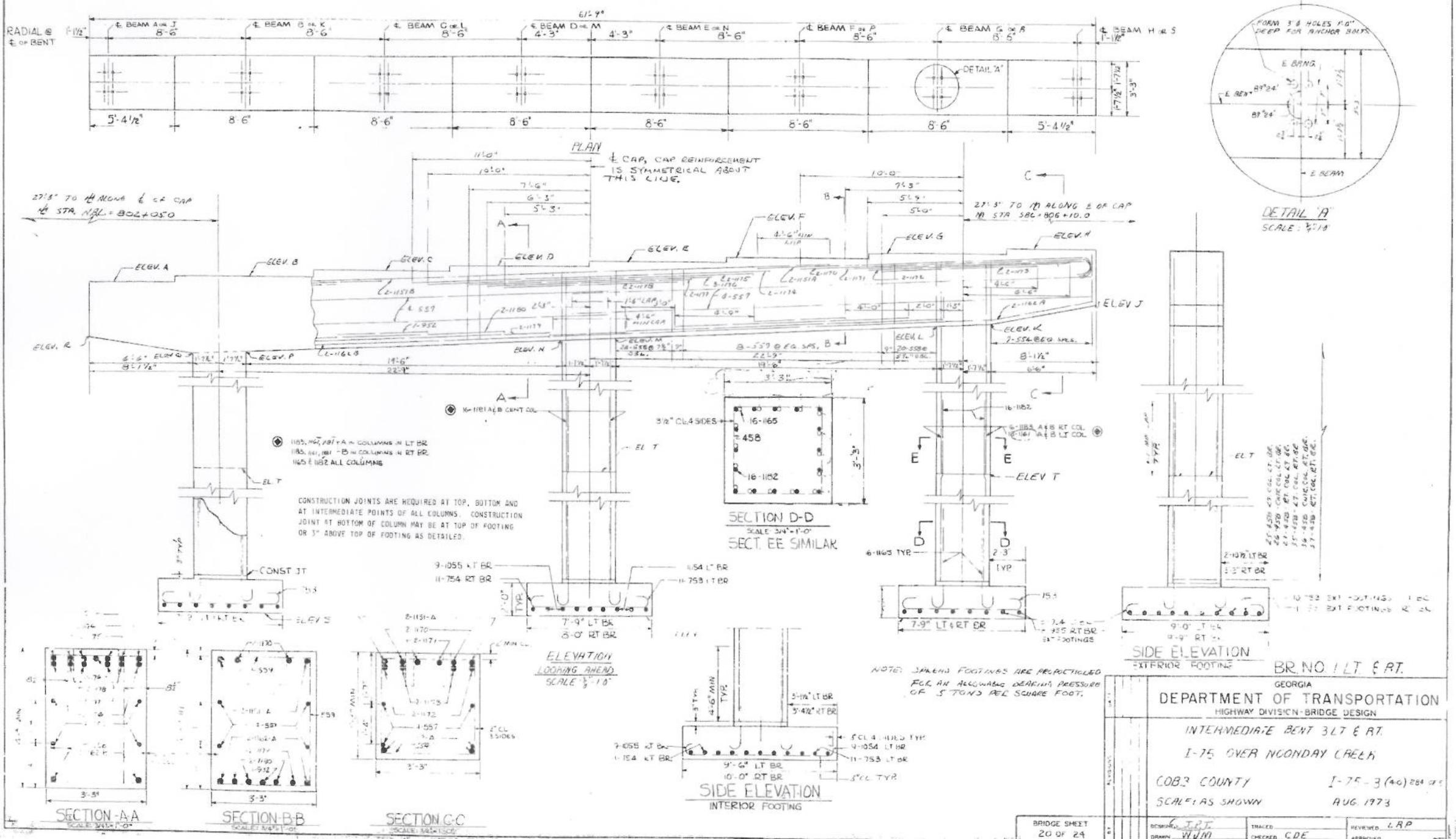


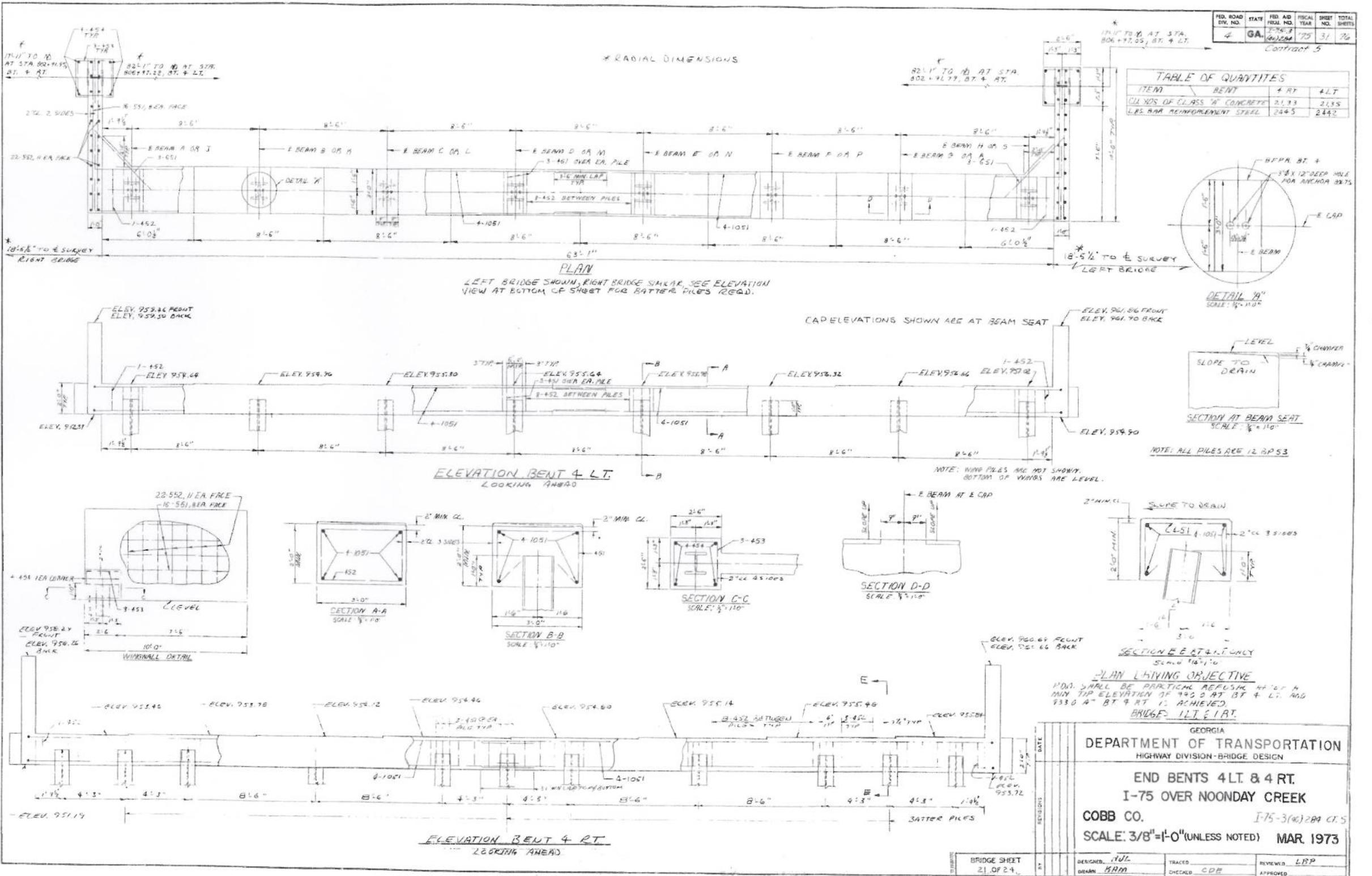
TABLE OF ELEVATIONS																					
BENT	ELEV.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
3 RT	958.70	959.02	959.36	959.70	955.04	955.38	955.72	956.08	952.68	951.42	952.24	950.51	950.38	949.60	949.41	950.21	949.02	936.5			
3 LT	958.36	958.68	955.02	955.36	955.70	956.04	956.38	956.74	958.34	956.08	951.75	951.17	951.04	950.26	950.13	950.87	926.5	942.0			

TABLE OF QUANTITIES			
ITEM	BENT	3LT.	3 RT.
CU. YDS. CLASS A CONCRETE	76.81		87.67
LBS. BAR REINFORCEMENT STEEL	18,535		21,387

FED. ROAD DIV. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHET. NO.	TOTAL SHEETS
4	GA.	5753 <i>Colquitt</i>	'75	30	76

Contract 5





BRIDGE NO. 111 E RT
STATE HIGHWAY DEPARTMENT OF GEORGIA

BAR REINFORCEMENT STEEL, IN. NO. 1

BAR REINFORCEMENT STEEL SH. NO 1

I-75 OVER NOONDAY CREEK

COBB COUNTY

1-15-3 (40) CERT D. S.

NO SCALE SEPT, 1974

日期_____ **TRACED** _____ **SEARCHED** _____

DRAWN	CHECKED	REVIEWED
		APPROVED

11

MARK	DEPTH	NO. OF C	C	A	G	B	C	D	E	F	G	H	I	J	K	L	M
654	11- 6	3	1														
655	4- 3	3	1														
755	7- 0	7	9 2														
756	7- 4	6	9 2														
757	7- 7	1	9 2														
758	9- 8	7	9 2														
759	10- 0	7	9 2														
760	12- 0	8	1														
761	4- 9	3	1														
762	11- 16	20	1														
763	4- 9	17	1														
764	6- 0	4	1														
765	VARY	5	1														
766	13- 5	5	3														
851	VARY	12	1														
852	8- 4	11	5														87
853	5- 1	12	5														87
956	9- 0	21	1														
957	11- 6	6	1														
056	7- 4	7	9 2														
057	7-11	2	9 2														
058	8- 2	2	9 2														
059	9- 1	1	9 2														
060	8-10	1	9 2														
061	9- 4	2	9 2														
062	10- 2	1	9 2														
063	11- 1	2	9 2														
064	7- 5	7	9 2														
065	11- 1	1	9 2														
066	11- 6	42	1														
067	12- 0	9	1														
456	10- 5	72	25 4 4														
553	VARY	14	25 4 4	VARIABLES	Z- 8												
555	13- 4	92	25 4 4	3-11	Z- 3												
556	14- 2	16	25 4 4	3-11	Z- 8												
557	31- 5	4	1														
151	X- 6	31	10 2 2	Z- 0													

FILE NUMBER	STATE	TELE. NO.	STATE NO.	FISCAL YEAR	INCHES	TOTAL FEET
2	GA	275-3 580284	75	33	76	

Contract 5

MARK	LENGTH FT. IN	NO. T BARS IN REGR E	P AG	B		C		D		E		F		H		J		K		N	Θ
				FT	IN	FT	IN	FT	IN	FT	IN	FT	IN	FT	IN	FT	IN	FT	IN	FT	IN
452	0- 5	58	25																		
453	9- 5	6	25																		
454	1- 8	8	1																		
551	9- 8	32	1																		
552	0- 8	44	1																		
651	0- 0	6	1																		
1051	36- 0	8	3																		
456	10- 5	65	25																		
553	VARY	14	25	4	4	VARIES		2- 0													
555	13- 4	92	25																		
556	14- 2	14	25																		
557	31- 9	8	1																		
751	8- 6	20	10																		
752	8- 3	11	10	2	2	8- 0															
951	6- 1	2	1																		
952	5- 6	1	1																		
953	10- 6	16	10																		
1054	10-11	4	10	2	2	8- 9															
1151A	22- 4	2	9																		
1151B	45- 6	2	9																		
1152	12- 8	4	9																		
1153	14- 8	4	1																		
1154	11- 6	4	1																		
1155	9- 0	4	1																		
1156	22- 0	1	2																		
1157	17- 6	2	1																		
1158	14- 0	2	1																		
1159	12- 6	4	1																		
1160	11- 0	2	1																		
1162A	23- 0	2	25																		
1162B	22- 0	2	25																		
1163	19- 0	4	1																		
1164	14- 3	9	1																		
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1166	10- 2	12	1																		
1167a	15- 1	12	1																		

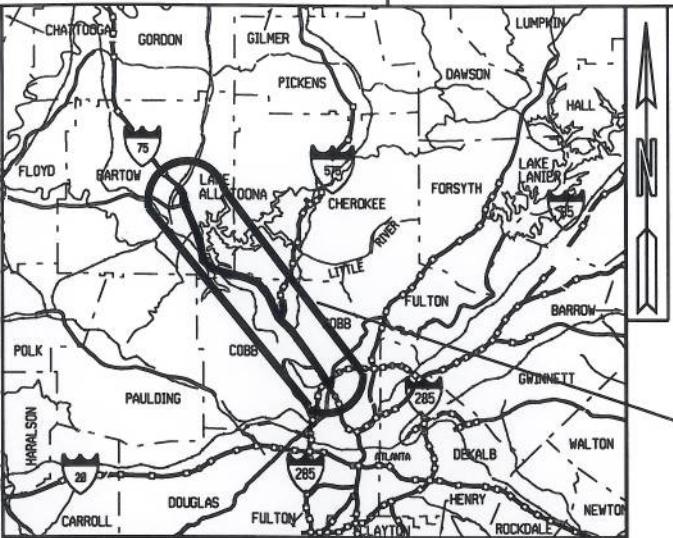
LOCATION	NO. OF LOC	MARK	LENGTH FT.	NO. T BARS IN REGR E	P AG	B FT. IN

RE. RIB ID. NO.	STATE	PER. NO.	STATE NO.	PER. YEAR	SHEET NO.	TOTAL SHEETS
4 GA	1753	00184	175	34	76	

Contract 5

RECORDED BY: [Signature] DATE: [Signature]

ROADWAY PLAN AND PROFILE



DEPARTMENT OF TRANSPORTATION STATE OF GEORGIA

PLAN AND PROFILE OF PROPOSED I-75 REVERSIBLE LANES NH000-0073-03(242) COBB COUNTY FEDERAL AID PROJECT

I-75 PROJECT NH000-0073-03(242), PI 714130
COBB COUNTY

NOTE :
ALL REFERENCES IN THIS DOCUMENT, WHICH INCLUDES ALL PAPERS, WRITINGS,
DOCUMENTS, DRAWINGS, OR PHOTOGRAPHS USED, OR TO BE USED IN CONNECTION
WITH THIS DOCUMENT, TO "STATE HIGHWAY DEPARTMENT OF GEORGIA", "STATE
HIGHWAY DEPARTMENT", "GEORGIA STATE HIGHWAY DEPARTMENT", "HIGHWAY
DEPARTMENT", OR "DEPARTMENT" WHEN THE CONTEXT THEREOF MEANS THE
STATE HIGHWAY DEPARTMENT OF GEORGIA, AND SHALL BE DEEMED TO MEAN
THE DEPARTMENT OF TRANSPORTATION.

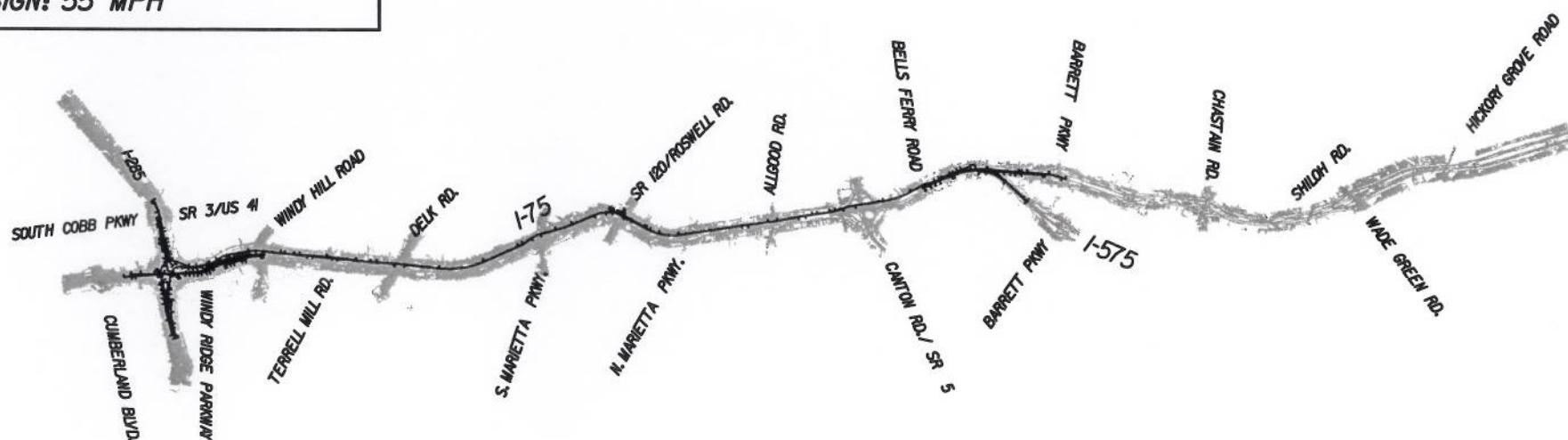
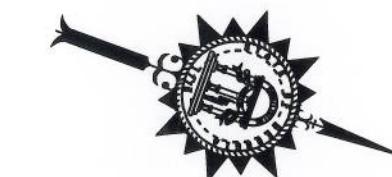
LOCATION SKETCH

DESIGN DATA:
TRAFFIC ADT:
TRAFFIC ADT:
TRAFFIC ADT:
TRAFFIC DHV:
DIRECTIONAL DIST:
% TRUCKS:
24 HR. TRUCKS %:
SPEED DESIGN: 55 MPH

FEDERAL ROUTE • I-75

STATE ROUTE • 417

PJ.NO. 714130



PREPARED BY: _____
DESIGN

RECOMMENDED FOR
SUBMISSION BY: _____
DESIGN

SUBMITTED BY: _____
STATE _____ DESIGN ENGINEER _____

DATE	CHIEF ENGINEER
PLANS COMPLETED	REVISED FIRST UTILITY SUBMISSION 9/25/09
REVISIONS:	

THIS PROJECT HAS BEEN PREPARED
USING THE HORIZONTAL GEORGIA
COORDINATE SYSTEM OF 1984 (NAD
1983/94 WEST ZONE) AND THE NORTH
AMERICAN VERTICAL DATUM (NAVD)
OF 1988.

PBS&

GTP GEORGIA
TRANSPORTATION
PARTNERS



SCALE IN FEET
0 5000 10000 20000

LENGTH OF PROJECT	COUNTY No.057/057 Project No.
	MILES
NET LENGTH OF ROADWAY	
NET LENGTH OF BRIDGES	
NET LENGTH OF PROJECT	
NET LENGTH OF EXCEPTIONS	
GROSS LENGTH OF PROJECT	

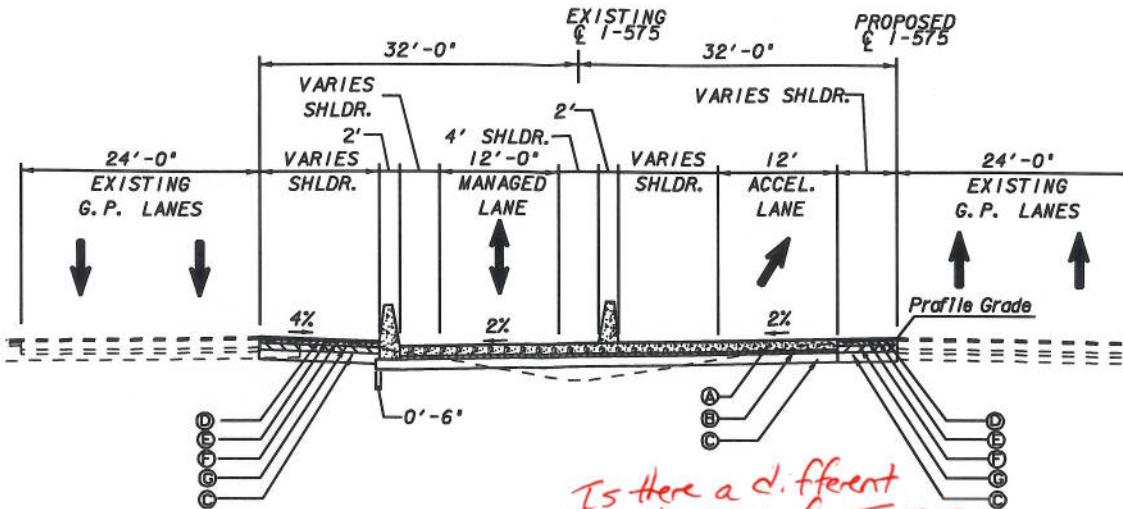
LOCATION & DESIGN
APPROVAL DATE:

FUNCTIONAL CLASS:
INTERSTATE PRINCIPAL ARTERIAL

THIS PROJECT IS 100% IN COBB COUNTY
AND IS:
% IN CONG. DIST. NO. II,
% IN CONG. DIST. NO. 6

PROJECT DESIGNATION: EXEMPT
DESIGNED IN ENGLISH UNITS.

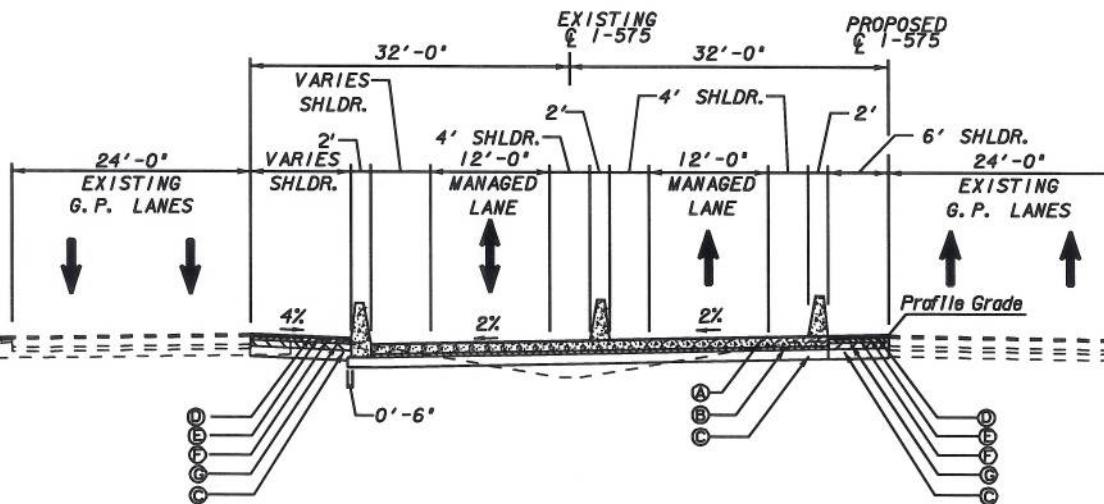
THE DATA, TOGETHER WITH ALL OTHER INFORMATION SHOWN ON THESE PLANS OR IN ANY WAY
INDICATED THEREBY, WHETHER BY DRAWINGS OR NOTES, OR IN ANY OTHER MANNER, ARE BASED UPON
FIELD INVESTIGATIONS AND ARE BELIEVED TO BE INDICATIVE OF ACTUAL CONDITIONS, HOWEVER,
THE SAME ARE SHOWN AS INFORMATION ONLY, ARE NOT GUARANTEED, AND DO NOT BIND THE
DEPARTMENT OF TRANSPORTATION IN ANY WAY. THE ATTENTION OF BIDDER IS SPECIFICALLY
DIRECTED TO SUBSECTIONS 102.04, 102.05, AND 104.03 OF THE SPECIFICATIONS.



TS-10 - I-575 TANGENT SECTION
ONE-LANE REVERSIBLE

APPLIES TO: STA. 1112+53 TO STA. 1118+00
APPLIES TO: STA. 1326+72 TO STA. 1332+00

PAVEMENT MATERIAL SCHEDULE	
(A)	PLAIN PORTLAND CEMENT CONCRETE WITH DOWELS, 12 INCH
(B)	19 MM SUPERPAVE, MIX DESIGN LEVEL A, 330 LBS./SY
(C)	GRADED AGGREGATE BASE, 12 INCH
(D)	RECYCLED ASPH. CONC. 12.5 mm PEM, 135 LBS./SY
(E)	RECYCLED ASPH. CONC. 12.5 mm SMA, 165 LBS./SY
(F)	RECYCLED ASPH. CONC. 19 mm SUPERPAVE, 660 LBS./SY
(G)	RECYCLED ASPH. CONC. 25 mm SUPERPAVE, 880 LBS./SY



TS-09 - I-575 TANGENT SECTION
ONE-LANE REVERSIBLE
APPLIES TO: STA. 1109+53 TO STA. 1112+53
APPLIES TO: STA. 1325+79 TO STA. 1326+72

0141

30-SEP-2009

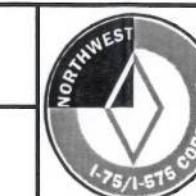
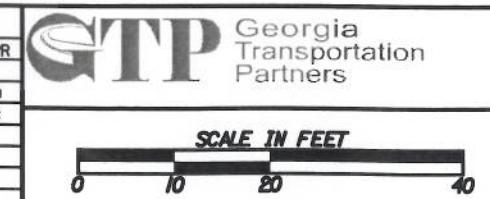
n:\tra\2557170\c:\v\7141\307typ.dgn

REF FILES

MINDY SANDERS	9/23/09
DRAWN BY	DATE
STEVE LINLEY	9/23/09
CHECKED BY	DATE
STEVE LINLEY	9/23/09
SUPERVISOR	DATE
LARRY COOK	9/23/09
APPROVED	DATE

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	CEC	PCT	MRM	RHM
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC



I-75 / I-575 NORTHWEST CORRIDOR

TYPICAL SECTIONS
I-575 REVERSIBLE MANAGED LANES

DRAWING NO.
05-05

SCALE IN FEET
0 10 20 30 40

STATE **PROJECT NUMBER** **SHEET NO.** **TOTAL SHEETS**

GA	NH000-0073-03(242)		
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CURVE A2
 P1 STA - 49+00.49
 N - 1463810.38
 E - 2173945.04
 DELTA - 7°44'07.3" (LT)
 DEGREE - 1°30'00.31"
 TANGENT - 258.22
 LENGTH - 515.66
 RADIUS - 3819.50
 DESIGN SPEED - 55 MPH

I-75 SOUTHBOUND

RAMP A CONST £

CURVE A1

CURVE A2

I-75 NORTHBOUND

BEGIN WALL 52
 STA. 836+67
 37' LT

EXIST R/W

N/F Schlesinger Family 1605740008

N/F DNP Kennesaw, LLC 1605070018

N/F Bright Meyers 1605030006

TRACKING

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	8/30/09	PROGRESS DRAWINGS (ROLL PLOTS)	MHS	SJL	SJL	LFC
B	9/25/09	50% SUBMITTAL	MHS	SJL	SJL	LFC

GTP Georgia Transportation Partners

DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

JBT J.B. TRIMBLE, INC.
 2550 Heritage Court SE
 Suite 250
 Atlanta, Georgia 30339

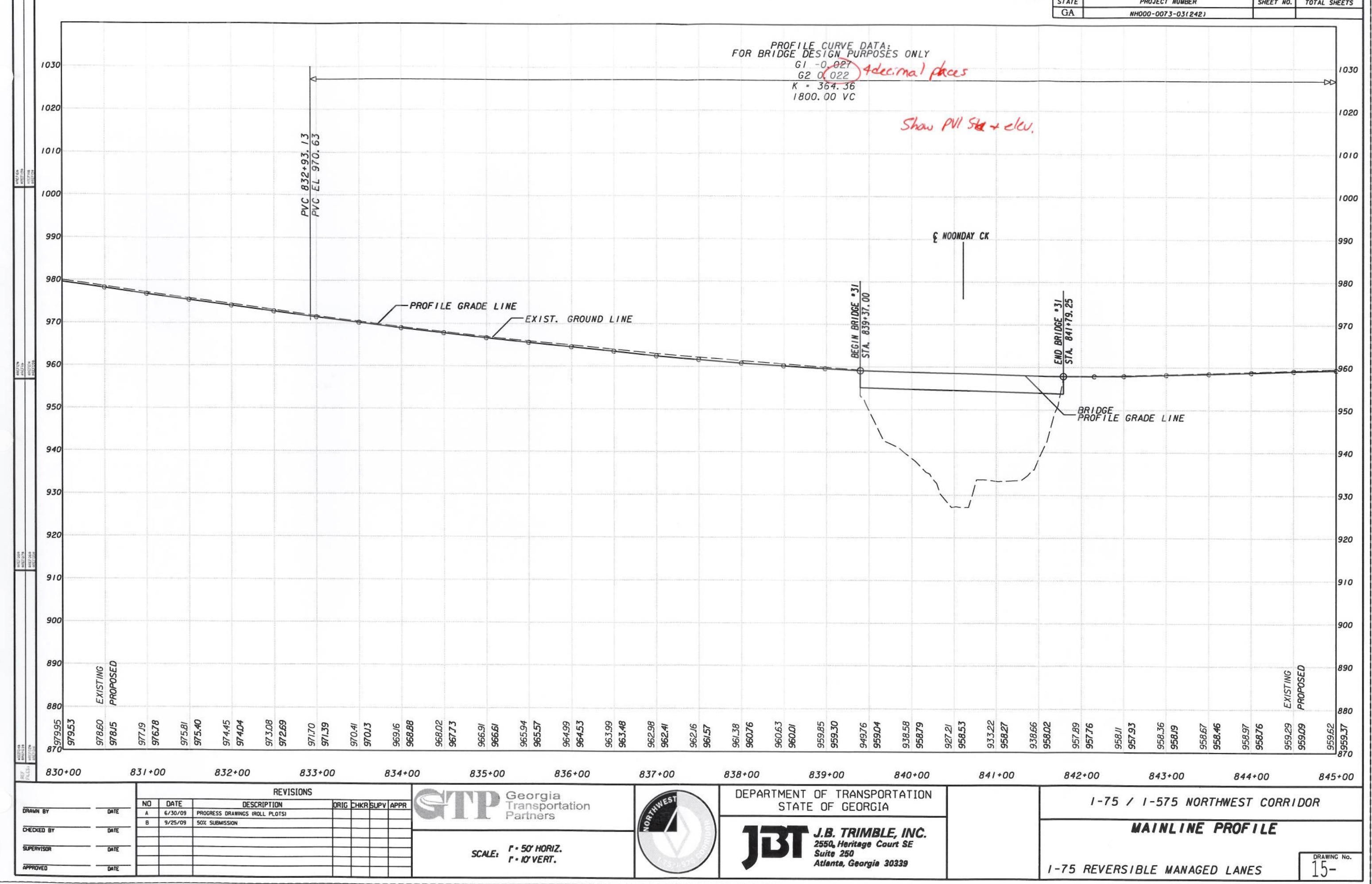
I-75 / I-575 NORTHWEST CORRIDOR
CONSTRUCTION PLAN

I-75 REVERSIBLE

DRAWING NO. 13-47

PROFILE CURVE DATA:
FOR BRIDGE DESIGN PURPOSES ONLY
G1 -0.027
G2 0.022
K = 364.36
1800.00 VC

Show PVI Sta + elev.



**PROFILE CURVE DATA:
FOR BRIDGE DESIGN PURPOSES ONLY**

G1 -0.027
G2 0.022
K = 364.36
1800.00 VC

**PROFILE
PVI DATA:
FOR BRIDGE DESIGN PURPOSES ONLY**

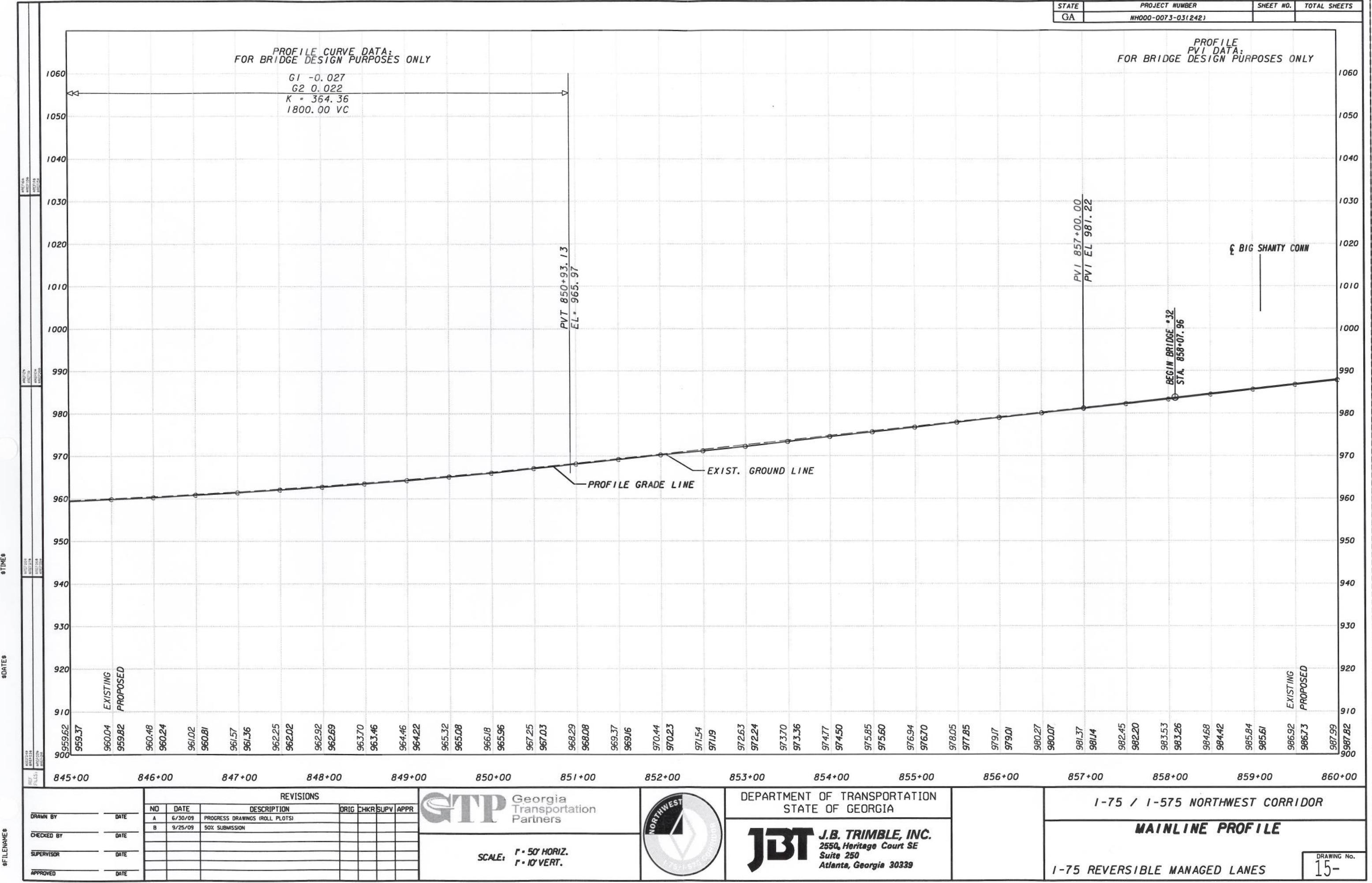
PVI 857+00.00
PVI EL 981.22

E BIG SHANTY CONN

BEGIN BRIDGE #32
STA. 858-07.96

PVT 850+93.13
EL = 965.97

EXIST. GROUND LINE
PROFILE GRADE LINE



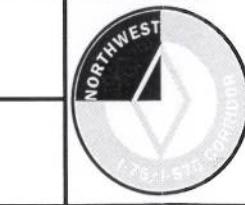
FILE NAME: _____
DRAWN BY _____ DATE _____
CHECKED BY _____ DATE _____
SUPERVISOR _____ DATE _____
APPROVED _____ DATE _____

REVISIONS

NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	PROGRESS DRAWINGS (ROLL PLOTS)				
B	9/25/09	50% SUBMISSION				



Georgia
Transportation
Partners



DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

JBT J.B. TRIMBLE, INC.
2550, Heritage Court SE
Suite 250
Atlanta, Georgia 30339

SCALE: 1'-50' HORIZ.
1'-10' VERT.

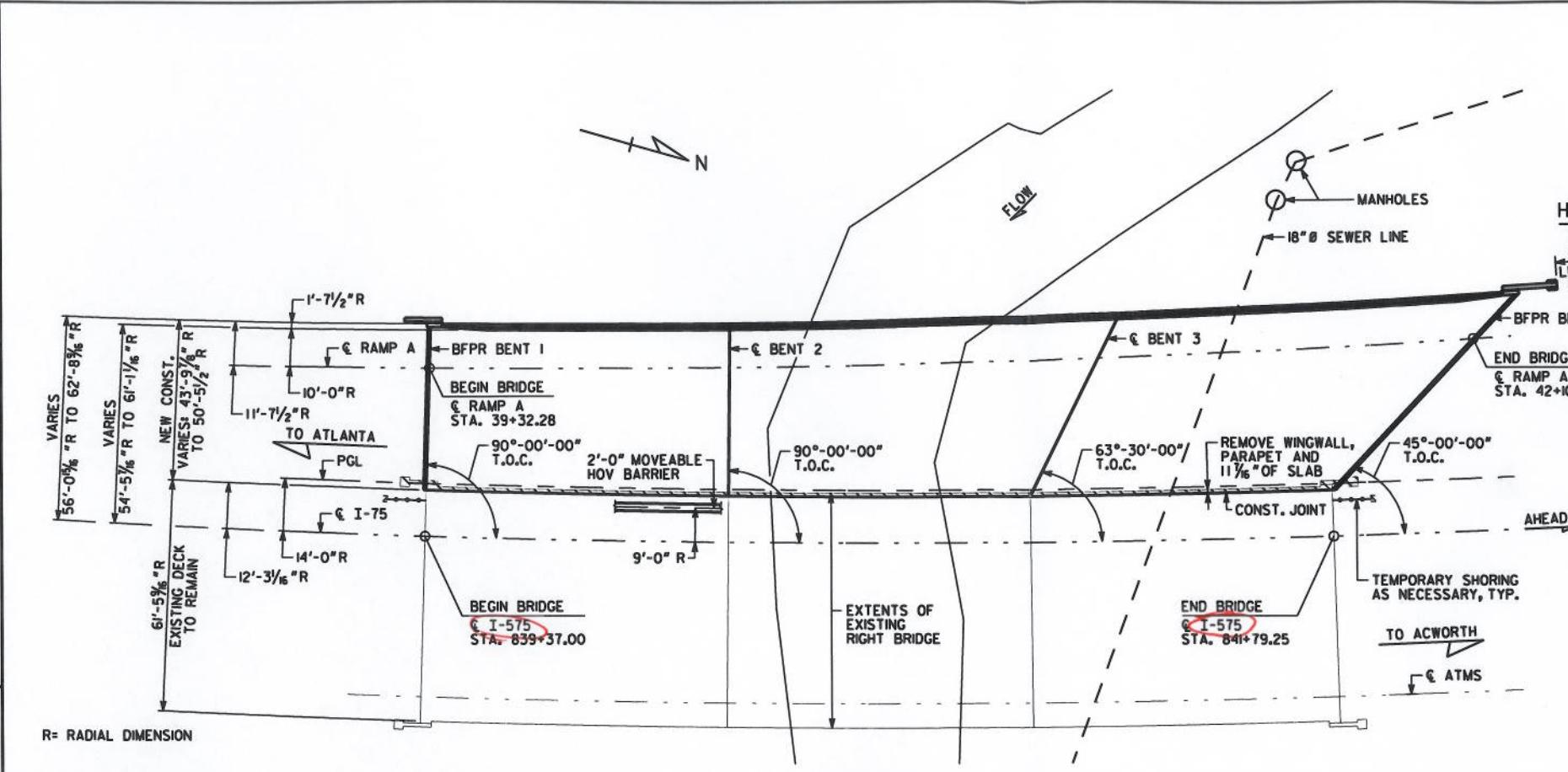
I-75 / I-575 NORTHWEST CORRIDOR

MAINLINE PROFILE

I-75 REVERSIBLE MANAGED LANES

DRAWING NO.
15-

**PRELIMINARY BRIDGE PLAN AND ELEVATION
SECTION**



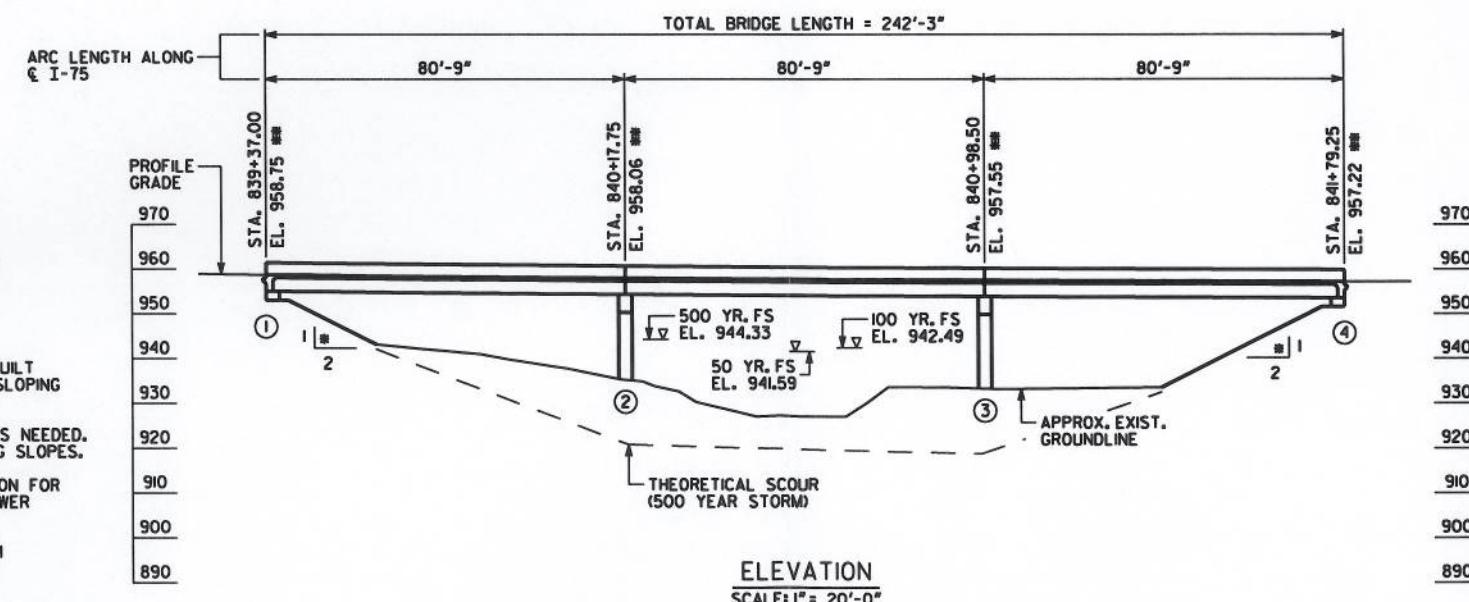
R = RADIAL DIMENSION

BERM ELEVATIONS		
BENT	LEFT	RIGHT
I	951.12	952.56
4	948.49	950.31

NOTE: FOR BRIDGE ENDROLL STAKING PURPOSES ONLY.

NOTES:

1. # SLOPE NORMAL TO END BENTS.
2. # STATIONS ARE ALONG & I-75 AT THE INTERSECTION OF & I-75 AND BFPR OR & BENT. ELEVATIONS ARE ALONG PGL.
3. END BENT PILES NOT SHOWN.
4. THE PROPOSED BRIDGE DECK IS TO BE BUILT ON A CONSTANT CROSS SLOPE OF 4%, SLOPING DOWN TO THE LEFT.
5. REPAIR AND REPLACE EXISTING RIPRAP AS NEEDED. EXTEND APRON ACROSS TOE OF EXISTING SLOPES.
6. THE MINIMUM BOTTOM OF BEAM ELEVATION FOR THE PROPOSED BRIDGE SHALL BE NO LOWER THAN ELEVATION 943.59
7. THE PROPOSED BRIDGE BOTTOM OF BEAM ELEVATION IS 950.74



ABBAS ESHAGHEH-MEYBOODI	11/20/09
DRAWN BY	DATE
JOHN ROSSLOW	11/20/09
CHECKED BY	DATE
GARRICK EDWARDS	11/20/09
SUPERVISOR	DATE
STEPHEN LINLEY	11/20/09
APPROVED	DATE

REVISIONS						
NO	DATE	DESCRIPTION	ORIG	CHKR	SUPV	APPR
A	6/30/09	Progress Drawings ISO II Revision 21	AEM	JCR	GLE	SJL
B	9/25/09	50% SUBMISSION	AEM	JCR	GLE	SJL
C	11/20/09	HYDRAULIC STUDY SUBMISSION	AEM	JCR	GLE	SJL

GTP Georgia Transportation Partners



DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

JBT J.B. Trimble, Inc.
2550 Heritage Ct, SE Suite 250
Atlanta GA 30339-3062
(770) 952-1022



BRIDGE SHEET
1 OF 2

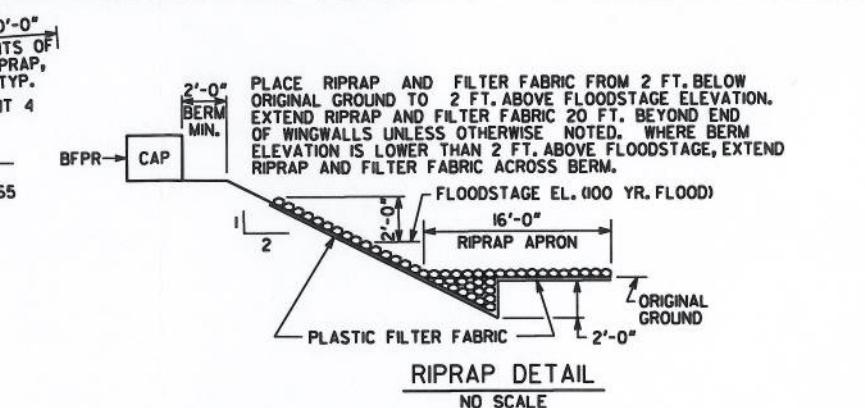
I-75 / I-575 NORTHWEST CORRIDOR
I-75 REV OVER NOONDAY CREEK
PLAN AND ELEVATION
COBB COUNTY
NH000-0073-03(242)

STATE	PROJECT NUMBER	HEET NO.	TOTAL SHEETS
GA	NH000-0073-03(242)		

P.I. STA. = 844+76.91 -2.7292% +2.2110% P.I. STA. = 42+12.11
 Δ = 20°-18'-24" Δ = 12°-55'-47.5"
 D = 1°-28'-36" D = 1°-29'-47.55"
 T = 694.86 FT $EL.$ 946.07 T = 433.83 FT
 L = 1375.14 FT R = 3880.00 FT L = 863.98 FT
 R = 3828.55 FT

& I-75 HORIZONTAL CURVE DATA GRADE DATA

& RAMP AI HORIZONTAL CURVE DATA



DESIGN DATA

SPECIFICATIONS ----- AASHTO 17TH EDITION, 2002
 (DESIGNED FOR SEISMIC PERFORMANCE CATEGORY B)
 TYPICAL HS20-44 AND/OR MILITARY LOADING --- IMPACT ALLOWED
 FUTURE PAVING ALLOWANCE ----- 30 LBS PER SQ FT

WIDENED BRIDGE CONSISTS OF

- 1 - 80'-9" W BEAM COMPOSITE SIMPLE SPAN ----- SPECIAL DESIGN
- 2 - 80'-9" PLATE GIRDER COMPOSITE SIMPLE SPANS (TRAPEZOID) ----- SPECIAL DESIGN
- PILE END BENTS ----- SPECIAL DESIGN
- CONCRETE INTERMEDIATE BENTS ----- SPECIAL DESIGN

24" TYPE I RIP RAP

EXISTING UTILITIES ON BRIDGE

4 - 4 INCH DIAMETER ATMS ----- GEORGIA DEPARTMENT OF TRANSPORTATION

EXISTING UTILITIES UNDER BRIDGE

18" STEEL SANITARY SEWER

DRAINAGE DATA

DRAINAGE AREA ----- 11.0 SQ MI

FLOOD FREQUENCY	DISCHARGE THRU BRIDGE	MEAN VELOCITY	AREA OF OPENING UNDER FLOODSTAGE	BACKWATER
50 YEAR	6003 CFS	4.34 FPS	1382 SQ FT	0.49 FT
100 YEAR	6889 CFS	4.46 FPS	1544 SQ FT	0.37 FT
500 YEAR	8519 CFS	4.53 FPS	1881 SQ FT	0.08 FT

THEORETICAL SCOUR DEPTHS (FT)						
BENT LOCATION	100 YEAR STORM		500 YEAR STORM			
	GENERAL	LOCAL	TOTAL	GENERAL	LOCAL	TOTAL
BENT 2	1.0	13.0	14.0	1.0	13.3	14.3
BENT 3	3.4	13.0	16.4	1.0	13.3	14.3

EXISTING RIGHT BRIDGE SERIAL NO. 067-0083-0
 EXISTING RIGHT BRIDGE I.D. NO. 067-0040ID-270.25N
 PROJECT P.I. NO. 71430

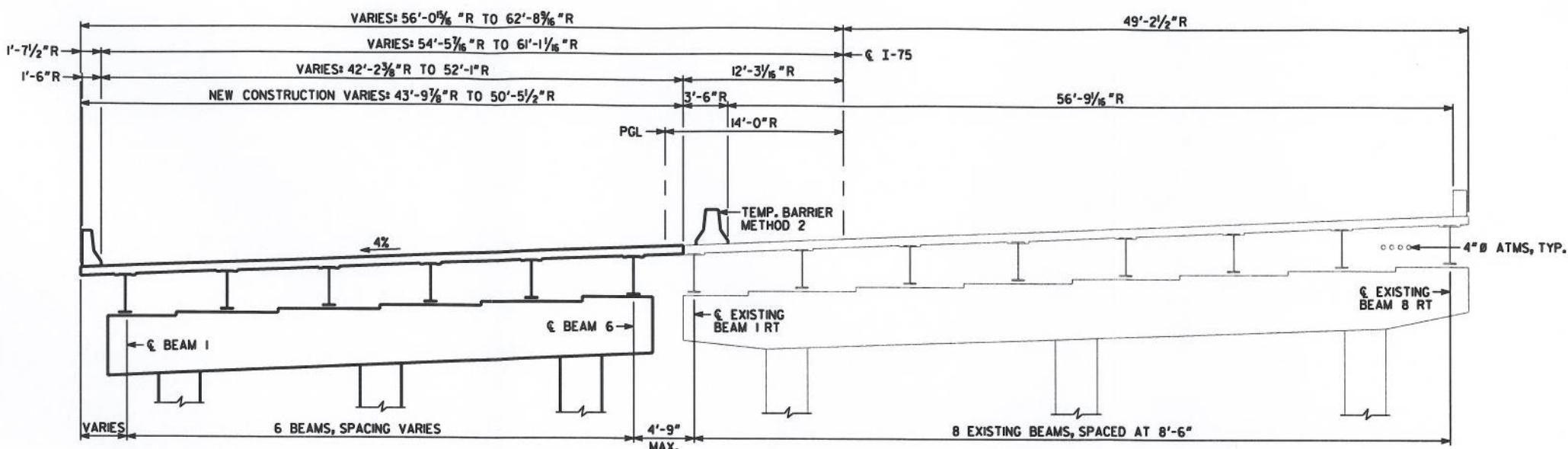
BRIDGE NO. 3I

I-75 / I-575 NORTHWEST CORRIDOR

I-75 REV OVER NOONDAY CREEK
PLAN AND ELEVATION

NH000-0073-03(242)

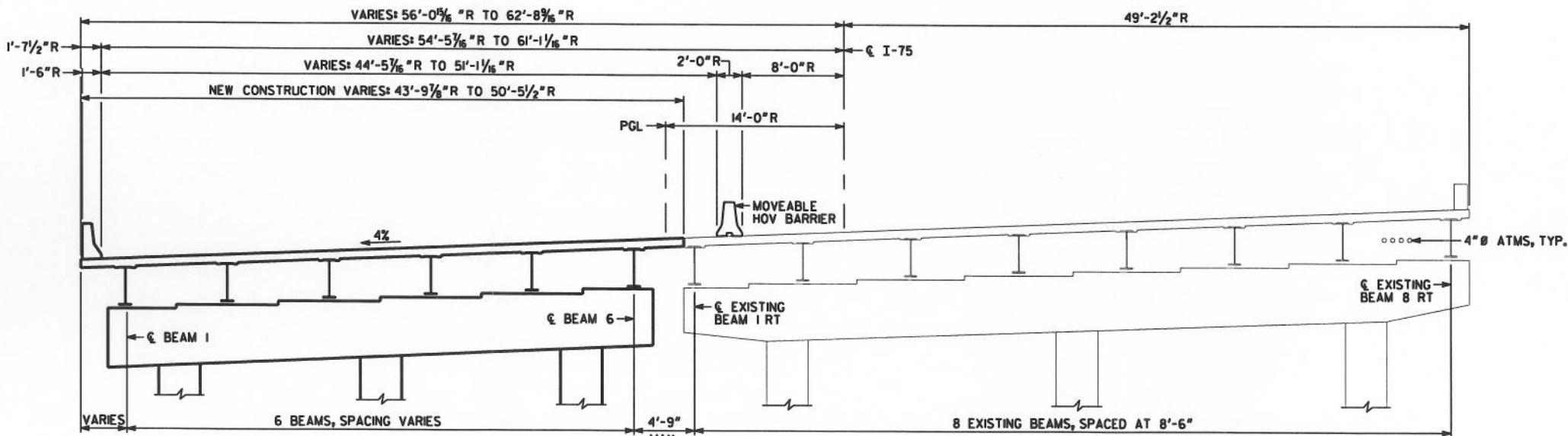
R = RADIAL DIMENSION



TYPICAL SECTION
(LOOKING AHEAD, RIGHT BRIDGE)

CONSTRUCTION SEQUENCE

1. PLACE TEMPORARY BARRIER. MAINTAIN THREE 12'-0" LANES OF TRAFFIC IN EACH DIRECTION ON EXISTING BRIDGES.
2. REMOVE PORTIONS OF EXISTING NORTH BOUND BRIDGE AS NECESSARY FOR NEW CONSTRUCTION.
3. CONSTRUCT NEW SUBSTRUCTURE.
4. CONSTRUCT NEW SUPERSTRUCTURE.



TYPICAL SECTION
(LOOKING AHEAD, RIGHT BRIDGE)

BRIDGE NO. 31

REVISIONS	
ABDAS ESHAGHEH-MEYBOOD	11/20/09
DRAWN BY	DATE
JOHN ROSSLOW	11/20/09
CHECKED BY	DATE
GARRICK EDWARDS	11/20/09
SUPERVISOR	DATE
STEPHEN LINLEY	11/20/09
APPROVED	DATE

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DEPARTMENT OF TRANSPORTATION
STATE OF GEORGIA

J.B. Trimble, Inc.
2550 Heritage Ct, SE Suite 250
Atlanta GA 30339-3062
(770) 952-1022

BRIDGE SHEET
2 OF 2

I-75 / I-575 NORTHWEST CORRIDOR
**I-75 REV OVER NOONDAY CREEK
CONSTRUCTION SEQUENCE**

NH000-0073-03(242)